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VALEDICTORY ADDRESS TO THE GRADUATES OF THE PHILADELPHIA COLLEGE OF PHARMACY,

Delivered March 11th, 1858, at the Musical Fund Hall,*

By WILLIAM PROCTER, JR.

GENTLEMEN:—A time-honored custom requires that the ceremonial which has just been witnessed, should be followed by a word of gratulation and advice; and the duty of conveying it to you, on this interesting occasion, has devolved upon me.

The old relationship of teacher and pupil having ceased, permit me to welcome you into the ranks of the pharmaceutical profession, as qualified to take part in its duties and its requirements, and determined to win the honors and emoluments to which a faithful fulfilment of them will justly entitle you.

The steps by which you have gained your present position have been many and tedious; marked with numerous trials calculated to discourage your progress. These accidents of fortune have not proved injurious:—the blasts that assail the hill-side oak but develop its internal power of resistance, intertwine more closely its fibres, and consolidate its tissues;—so the difficulties of your novitiate,—your apprenticeship,—have tended to bring out your latent qualities; stimulate your ingenuity; teach you the power of patience, the force of endurance, and the all-conquering influence of perseverance, when directed to the attainment of an education in Pharmacy.

The profession you have adopted is among the most respectable that engage the attention of men; its results are directly beneficial to the community, when its practice is in the hands of

** Extract from the Minutes of the Board of Trustees, March 9, 1858.*

"Resolved, That Prof. Procter be desired to furnish a copy of his Valedictory Address to the Graduating Class, at the coming Commencement, for publication in the American Journal of Pharmacy."

ALFRED B. TAYLOR, *Secretary.*

qualified individuals; and without its aid the physician is greatly circumscribed in his ability to restore the sick to health and enjoyment. The function of the apothecary is one of great responsibility, in so far as he is the custodian of the powerful agents by which cure is effected. Ignorance or carelessness on his part may wholly defeat the wisest diagnosis, and most appropriate prescription; may baffle the physician in his endeavors to cope with disease; and even consign the sufferer to an untimely grave. In this view, then, the claims of Pharmacy to rank as an honorable calling, involving regular studies and skillful practice, will not be disputed; nor will the pharmacist, when worthily engaged in its legitimate offices, fail to receive the respect and support of the community in which he may be located.

The history of Pharmacy, as it *was* and as it *is*, is a curious and interesting study, even to the non-professional inquirer. In the earlier ages it was included in the occupation of the physician; but a few years have elapsed since this union was severed in the cities of the United States, and at this time many instances occur, where the duties of physician and apothecary are united in the same individual. They are, nevertheless, distinct avocations, tending to the same end; between them a mutual check reaction occurs, healthful to each class.

It is not my purpose, however, to occupy our time this evening with the records of the past, full of teaching as they are to those who consult them earnestly; yet it seems entirely appropriate on an occasion like the present, when a numerous representation from the community in which we live have honored us by their presence, to present a view of the true character of the duties which Pharmacy owes to Medicine and to the community, with the obligations due by these in return.

In the long course of ages, medical observers, aided by accident, have detected a curative power in numerous substances existing in nature. So universal is the necessity for medical aid, that men in all countries agree in promoting the discovery of every thing capable of increasing its power and certainty; and in enlightened countries of the present day, the care and preparation of these agents has been committed to a distinct class, known as apothecaries, pharmacutists, or chemists and druggists.

It has been elsewhere said, that the three primary duties of the pharmacist are "to procure and keep good drugs;" "to prepare from these efficient and uniform medicines;" and "to dispense these medicines to the sick, in a perfect condition."

To perform the first of these judiciously, the apothecary must know the nature and qualities of drugs, their tendency to deteriorate by age and exposure, the means of preserving them in the best manner, and lastly, he must conscientiously practice what he knows, the most difficult and often the least appreciated portion of his duty.

The study of drugs involves much scientific knowledge, leads the student into botany, mineralogy and other branches of natural history, and chemistry is largely concerned in judging of their quality. He will often observe an adaptation of means to ends in the production of medicinal substances, not less wonderful than in other results of creative power. The bark of the wild cherry tree is highly prized by the physician, for a remarkable association of tonic and sedative powers, extremely useful in pectoral and cardiac diseases. The principal upon which this sedative influence depends is prussic acid; the same volatile, evanescent substance, which, when made by the chemist, is so powerful a poison; and which, did it exist ready formed in the bark when gathered, would soon evaporate and leave it nearly worthless on drying. But so useful a drug has not been left liable to certain deterioration;—stored safely in the tissues of the bark are two distinct substances, neither of which is the medicinal acid, but when they come together in the presence of water, a chemical reaction occurs, and from the twain comes the valuable sedative full of healing power. It has been shown by one of your predecessors, that the value of this bark varies with the season of its collection, having double the strength in October that it has in May; and the well-informed apothecary, knowing this, avoids gathering the drug in the spring or summer.

The trees producing the Peruvian bark are found on the eastern slopes of the South American Andes, stretching from near the Caribbean Sea to the Bolivian Republic, growing at an elevation varying from 5000 to 9000 feet above the level of the sea. Many species of this tree exist, yielding barks of various quality and medical value; some containing much quinine,

others little, if any. The collectors of the bark are liable through ignorance, or tempted by gain, to substitute one for the other. How shall the apothecary, thousands of miles away from the lofty Cordilleras, where the bark is gathered, be able to avoid the results of this ignorance, or fraud, and shield the sick from the effects of the inert substitution? You, Gentlemen, can reply to this question, that you have been taught the nice means of discrimination, by which the genuine are distinguished from the spurious, or the bark of one species from that of another, by the color, the taste, the structure, the mosses that grow on their surfaces, but, beyond all other means, by that magical power of the chemist, which compels each bark to give up its secret strength, in kind and quantity, to his scrutinizing examination.

Among the natural causes which determine the value of medicinal substances, climate and soil exert a most remarkable influence. Fox-glove, so valuable as an arterial sedative in Europe, is shorn of half its power, when grown in the United States; Opium, when obtained in Turkey, differs materially, both in power and composition, from that produced in the valley of the Nile; and these, again, from the varieties raised in central India for the consumption of China. In the recesses of Chinese Tartary, carefully excluded from observation by the celestial policy, grow those valuable species of Rhubarb, yielding the best varieties of the drug, which, after centuries of medical experience, continue to hold a prominent position among the indispensables of the *Materia Medica*. Various efforts have been made to introduce these plants into Europe, and with apparent success; but though they grow with luxuriance, the principles upon which their medicinal value depend are but imperfectly developed; and as medicines, they are unfit to replace their oriental progenitors. Notwithstanding this fact has been proven and carefully recorded, thousands of pounds of European rhubarb are annually thrown into commerce, and consumed, not on its own merits, but as a cheap means of adulterating the more costly varieties of the East. Some of this European root rivals the genuine in the beauty of its internal structure and coloring; but its odor, and taste, and chemical composition, cease to correspond. From some local peculiarity of soil, oxalic acid combined with lime, is largely an ingredient in Tartarian rhubarb, whilst this salt is very slightly found in the product of

England and France; thus affording to the pharmaceutical chemist an unfailing criterion for detecting this fraudulent substitution, when other than ocular evidence is needed.

The natural causes of deterioration in drugs are, therefore, sufficiently obvious to require the watchful care of the apothecary to avoid their hurtful influence; but when to these are added the results of a wicked trade in adulterations, applicable to nearly every valuable item of the *Materia Medica*, the utmost prudence and acuteness is called for to avoid imposition. Cream of tartar, the pure acid salt of grape juice, is mingled with alum and vitriol; chalk, gypsum and barytes have been admixed with calomel; and the oil of lemons, so delightful for its fragrance, is reduced with the spirit of turpentine. In the means of recognising genuine, and detecting adulterated and spurious drugs, there is, Gentlemen, an ample field for the exercise of your experimental talents, and I trust you will enter it with enthusiasm, and partake of the pleasure, as well as reap the honors, which accrue to the successful prosecutor of this important and interesting branch of pharmaceutical investigation.

The conversion of drugs into efficient and uniform medicines, fitted for administration to the sick, requires the skill derived from practical experience; hence the importance placed by our College on a regular four years' apprenticeship, to acquire the details of the business. The purest and best drugs may become inert and valueless by unskilful preparation; compounds of safe and efficient powers may become poisonous, and changed in character, by careless manipulation and ignorance. The physician may have his faith in remedies destroyed by the use of ill-prepared samples, wholly unconscious of the short-coming of the apothecary upon whom he relied. It is the pride of the able pharmacist to render his preparations efficient in power, and beautiful in appearance; the contrast of the adept and the pretender is so perceptible in this department of the business, that the public eye will draw the distinction, in the transparency of syrups, the fineness of powders, and the creamy smoothness of ointments, when unable to judge of their medicinal power. If it is so important to attend to these visible, though not always essential evidences of care, how much more necessary is it to scrupulously effect the accurate combination of ingredients in the officinal preparations? By neglecting this care, precipitated

sulphur may become contaminated with twice its weight of plaster of Paris ; calomel, by careless washing, may contain corrosive sublimate ; glycerin may be affected by sensible portions of lead, and vegetable extracts by copper, from the use of ill-conditioned apparatus.

Gentlemen, the lessons you have learned in the laboratory and at the lecture room have taught you to avoid these errors, and they should not be forgotten, but by practice and study should be rendered more and more effective.

If the selection of drugs and the preparation of medicines involves so many requisites, the dispensing of these to the sick, by the prescription of the physician, calls for a higher qualification and a wider experience. Whatever knowledge he may have gained, to whatever extent his ingenuity may have been stimulated, however much his patience and care may have been cultivated, the conscientious apothecary finds ample scope for their exercise and employment in this division of his daily engagements. If he would avoid error, the dispenser must do nothing without the consent of his *will* ; he must be conscious of every act that he performs, and shun *mental preoccupation* as he would the fabled influence of the poison upas, as it is the *true* source of of most of the fatal mistakes, strictly due to the apothecary, which the annals of Pharmacy occasionally record. In reading a prescription the dispenser has not only to understand what is written, but he should feel satisfied that what it calls for is intended by the physician. Although, legally, the recipe of a physician is a sufficient guarantee to dispense any poison or composition, yet the pharmacist, when duly impressed with the responsibility of his office, feels morally bound to extend a rational judgment in reference to the prescription he dispenses, as well in justice to the prescriber, as to the patient and himself.

The exercise of this watchful supervision requires the greatest delicacy and discretion, when it leads the apothecary to believe he has detected an error. It is a matter solely between the physician and himself. He may find, on inquiry, that some peculiar condition of the patient required the unusual dose, and that his own judgment was wrong. Hence nothing short of a feeling of duty, based on the utmost certainty, should cause him to doubt the literal meaning of a physician's prescription, except in cases of omission.

Fortunately the need of this interposition is rarely required, and would be yet more infrequent, but for the thoughtlessness of those who are near the physician when engaged in writing his prescription. During this important act, when his faculties require to be concentrated on the requirements of the case, when a long list of medicines have to be selected from and associated, when the numerical proportions of these have to be calculated and symbolized, and the dose duly ascertained and indicated, he is frequently interrupted by the attendants with ill-timed and irrelevant questions, or by relatives with expressions of excited feeling, tending to distract his attention.

The subject of the custody and sale of poisons is of serious interest to the pharmacist. By the fiat of the Creator a large number of plants and minerals are noxious to animal life. Of these, many rank as eminently valuable medicines; others are used chiefly in the arts and sciences, and are kept by the apothecary and druggist. Not only has he to dispense these poisons by prescription, but many are habitually sold by the druggist, and bought by the people, without other license than that which creates the demand with the consumer, or which a sense of moral responsibility calls forth in the dispenser. Except in a few isolated localities, no legal regulations exist to restrain this traffic, and each dealer, be he druggist or apothecary, grocer or storekeeper, is left to pursue such policy in regard to it as he may deem expedient.

Until quite recently the same unrestrained trade existed in England, but Parliament, aroused by the frequent occurrence of accidental and murder poisoning, appointed a committee to frame a bill for the regulation of the sale of all poisonous agents. This committee has been in session for many months past, and have not yet perfected the draught of a law, owing to the numerous difficulties that arise when the attempt is made to render the law practically efficient, and at the same time not burdensome to the legitimate dispensing of medicines by pharmaceutical chemists.

So impressed was the American Pharmaceutical Association, at its late meeting in this city, with the practical difficulties that present in framing a statute to meet the evils of poisoning, that they preferred to confine their action to a circular of advice to apothecaries and druggists, rather than recommend legislative

interference, believing that a large number in all parts of the United States have adopted regulations for this traffic in their own undirected sense of its propriety.

Gentlemen, you need hardly be reminded of the precepts you have received from us in relation to this subject; nor will I doubt but that they will ever be remembered in your professional intercourse with the public. Toxicology, or the science of poisons, in its medico-legal aspect, is part of the acquirements of the thorough pharmaceutical chemist. He should be able to make investigations when duty calls him; but, let me advise you, leave such engagements for the *professional chemist*; do not seek these occasions of public notoriety, as the time consumed in the process, and the annoyance of judicial cross-questioning by opposing attorneys, to baffle and confuse your evidence, will more than outweigh the satisfaction that may arise from vindicating the power of science when exhibited in the service of justice.

Let us now take a view of the relative position of the dispenser and the community or neighborhood in which he is located. When an apothecary shop is opened, the proprietor tacitly, if not verbally, announces that he has prepared himself with the knowledge, skill and material required to perform the responsible duties that appertain to his vocation: each family around him have a direct interest in the truthfulness of this annunciation, as, sooner or later, all may be brought to the necessity of testing it practically. The nature of this knowledge and material is but obscurely understood by them; the pure and the impure, the inert and the poisonous, the true and the genuine, may be taken by each family in the confidence they repose in the ability and honesty of their dispenser. Gentlemen, mark this beautiful relationship! reflect on the almost child-like reliance which sends the family messenger to you for aid for its afflicted member! How priceless is the value of a pharmaceutical reputation, when exalted by knowledge and skill, and adorned with conscientiousness and integrity; and with what jealous care it should be tended that its brightness be not tarnished.

Like the physician, though in a different manner, the apothecary becomes the recipient of much that pertains to the unwritten history of his neighbors. In moments of distress, when

the delicate equilibrium of organic forces which result in health, are harshly assaulted by the emotions, chapters are opened which give insight into unseen and untold episodes of humanity. To his ear, poverty-engendered illness brings many a tale of mental and physical suffering, which else had remained untold and quietly borne until better times smiled on their subjects. He often beholds the secret motives which influence public actions; he can understand the brilliancy of many a speaker and actor on the surface of public life, and trace it to opium or chloroform. He can sometimes detect the primal efforts of the suicide and poisoner; to him comes the incipient, and yet shame-faced, inebriate, to get relief from the effects of his early aberrations, whilst he still regards a reputation for sobriety; and to him often applies the victim of unhallowed love, for aid in her last extremity, when despair, gathering its darkening folds around her, pictures the future an unfathomable abyss of blackness and woe.

Nor is it always in the darker phases of mental outpouring that the dispenser of medicines becomes the recipient of human confidence. Family joys as well as sorrows find utterance. He is often made a witness of the bright aspirations which arise on the occasion of the safe accession to the family circle of a new candidate for parental care and responsibility. When the wanderer has returned to his home, stricken with disease, the pleasure that wells up among its inmates is shared by the apothecary as he listens to the gladdened accents of a parent or brother, whilst preparing something for the relief of the sufferer. These confidences and opportunities are not restricted to a single class; all shades of society become objects of interest to the intelligent dispenser; and he should let discretion govern his tongue, and wisdom his actions, in relation to all that transpires of private history in his intercourse with those who frequent his establishment.

Gentlemen, you who are dispensers of medicine, need I caution you further in regard to your professional pathway? The precepts you have received and the practical training you have experienced have instilled into you the length and the breadth, the height and the depth of its varied requirements. Let me entreat you to keep them green and fresh in your memories; let a sense

of professional honor keep you in the line which has been marked out for your pursuit ; let no temptation allure you into a compromise with principle ; determine to execute your known duties, in the right spirit, and the reward will be the confidence, respect and patronage of your friends and neighbors.

Some of you propose to pursue the vocation of a druggist or wholesale dealer in drugs for supplying the dispenser. Are *you* fully imbued with a knowledge of its peculiar responsibilities ? Are *you* prepared to resist the temptation to sell worthless drugs, held out by the demands of the ignorant and unprincipled, to whom cheapness is the rule ? have you determined to exercise the knowledge and skill, just now so honorably accorded to you, in upholding the quality of imported drugs, and in protecting the well-disposed, though ignorant, who may come to you in good faith to purchase their stock ? Too many there are who buy and sell drugs, wholesale, without a thought of their object as means of cure, as agents, upon the quality of which the lives of their fellow men may depend. A real incident, which occurred to a friend of mine in New York, is so much to the point in illustration of this fact, that it may be safely adduced. This friend, who I shall call Colton, and who at that time was an eminent pharmacist on Broadway, having occasion to replenish his stock of cantharides, or blistering flies, called on the druggist, with whom he usually dealt, to procure them ; but he having none, application was made to another druggist, who shall be called Haswell. Entering the extensive establishment of the latter, the following dialogue ensued :

Colton.—"I am informed that you have powdered cantharides of good quality, and I am desirous of getting some that is reliable."

Haswell.—"Oh certainly ! you will find none better ; we had the powder made expressly for our sales, from selected flies."

Colton.—"I am particular in providing this drug, as you know how much depends on its efficient and prompt action."

Haswell.—"You may rely upon our article as in good condition."

Here the conversation closed, Colton gave his order, and left the store. Some weeks after, while he was engaged at his counter, Haswell walked in, evidently under some nervous excitement, when the following occurred :

Colton.—"Good morning, Mr. Haswell, can I serve you to day?"

Haswell.—"A member of my family has been taken suddenly ill; her physician, among other treatment, has prescribed a blister, and I have come out of my way, believing from your well-earned reputation that we may rely on your cerate, and much depends on the rapid action of the plaster.

Colton.—"I have always been careful in preparing this cerate from good flies, and fortunately, in this instance, I have your own testimony in addition, in their favor."

Haswell, who had till that moment forgotten the first transaction, quickly replied, "But, sir! are you sure those flies were active? have you tried them?"

Colton.—"You said they *were* when you sold them to me."

Haswell.—"But, my dear sir, this blister is for my *daughter*! Don't you understand me? for my *only daughter*! Can I rely upon it?"

Colton.—"For your DAUGHTER! And so my cerate is for every other man's daughter who deals with me, and who may need it, and who is as dear to his affection as yours is to you. When I purchased those flies from you, it was your reiterated assurance of their reliability that chiefly induced me to take them, but now I perceive that your language had no real value, and that it was given in the spirit of a huckster. I trust, sir, that this incident will be of use in your future transactions; and for your present comfort I may assure you that your flies were found to be efficient, before they were dispensed."

Haswell acknowledged the justice of the reproof, and said, that never before had he been properly impressed with the responsibility attached to the wholesale drug business.

I am happy to be able to say that the drug market of the United States has been favorably affected by the gradual operation of the drug law passed by Congress in 1848, rendering all imported drugs and medicinal preparations subject to inspection, before passing the Custom house. At the port of New York, during the period of eight years that this law was administered by Dr. M. J. Bailly, the late efficient Examiner, the amount of spurious, adulterated and deteriorated drugs rejected and screened out of the market, was 900,000 lbs., which vast amount, but for this *law*, would have been scattered through the country.

The picture drawn by Hassell of the adulterations of food and medicines practised in England, as revealed to him by the microscope, is as interesting as it is deplorable, and forms the subject of a volume now accessible to the public. The power of Parliament is being directed to this subject, as it relates to Great Britain, and something may be done to diminish the evils of adulteration, which are now so extensively practised by the tradesmen and manufacturers of that industrious people. But it may be doubted whether we, as a nation, are much behind them, in regard to "home adulterations." The power of Congress is limited to the Custom House when it presents us foreign products in good condition. Once beyond the Examiner, they are open to the mercy of American ingenuity; the skill which evinces itself in the production of *genuine* French brandies, wines and perfumes, is not slow to enter the domain of medicines, and by the aid of modern alchemy, transmute the bitterness of willow bark, and the glossy fibre of the cotton boll, into veritable quinine of Pelletier and Caventou.

Legislation, to meet this evil in its home aspect, must originate and be carried into effect, by the authorities of each State; adulterating medicines must be made a felony, punishable by statute, just as any other crime against the welfare of the public health. But amid the diversified interests striving for ascendancy at our legislative centres, such wholesome sanitary measures have little chance for a hearing; for, whilst even the reported approach of a pestilent epidemic will send forth stringent mandates, crippling commerce in their unsparing application of the laws of Quarantine, the perennial, ever present evils that we have pictured, flourish and extend, unheeded by the fathers of the State.

My friends! we are about to part. Before giving the sign let me tell you a truth—a truth which twenty-seven years of professional experience have but tended to confirm. The only permanent cure for these evils is the union of knowledge, skill and integrity in the dispenser of medicines.

As teachers, we have endeavored to give you the first. The second you have gained in the several establishments of your special preceptors. The last rests with yourselves. It is the crowning qualification, which, as worn or discarded, shall render

you a blessing or a curse to the communities in which your future lots may be cast. Let me earnestly invite you, then, to wear it in its purity and unsullied brightness, as it applies to your professional duties in all their details. Rest not satisfied with that phase of integrity which relates to the payment of debts, and the *visible* rendering of what is due to your neighbors and customers. This much can be legally and socially claimed of you, and the merest regard for reputation will lead to their liquidation. But let your integrity be *felt* by the invalid in the seclusion of his chamber, through the purity and perfection of your medicines, in the care exercised in dispensing them, and in your intelligent attention to the requirements of the physician, as expressed in his written prescriptions. Let it be *manifested* by your resistance to those strong temptations to gain, which a mercenary system of empiricism holds out to the apothecary and druggist, which, too often, render them willing agents in the deception of the public; and finally in a uniform and indiscriminating attention to the medical requirements of your several neighborhoods. Integrity thus practised brings a reward as certain as it is priceless, a satisfaction that no money can buy, second only to that higher happiness which crowns the fast held integrity of the good man, who has unswervingly performed all his moral and religious duties. *Farewell.*

ON COLCHICIA.

By JOHN E. CARTER.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

In selecting the subject of Colchicia for a thesis, I am not unaware of the fact that it has already been examined by several chemists; but as there is a want of agreement between different authorities respecting some of its properties, and inasmuch as it was stated, so recently as the past winter, that colchicia was merely veratria modified by coloring matter and adhering impurities, I have thought that there was still room for investigation.

Colechicum autumnale, or some very closely allied species of colchicum, was known to the ancient Greeks as a plant possessing remedial and even poisonous properties. Dr. Pereira states

that it was known to Dioscorides and his cotemporaries as an active drug. For a long time it fell into disrepute, and until the latter part of the eighteenth century it was scarcely, if at all, employed as a remedial agent. It was reintroduced to the notice of the medical profession by Baron Storck, about the year 1763, and since then both the seeds and corms have been extensively employed in the treatment of various diseases.

Colchicum belongs to the natural order Melanthaceæ which embraces a number of poisonous plants; among which are *Veratrum album*, *V. sabadilla*, *V. viride*, and *Asagrea officinalis*, all of which contain veratria, and as in some of its therapeutical effects, colchicum resembles veratria, this alkaloid was formerly supposed really to be the active principle of the plant. In fact, in the year 1820, Pelletier and Caventou announced the existence of supergallate of veratria in the corms. This statement was received as correct until 1833, when Geiger and Hess stated that they had succeeded in isolating from colchicum seeds a peculiar alkaloid, to which they gave the appropriate name of colchicine, and which, they stated, differed from veratria in being crystallizable, not sternutatory, more soluble in water and less acrid to the taste than veratria. Since then some chemists have denied the existence of a distinct alkaloid colchicia, and have asserted that it was identical with veratria; but within a few years it has been pretty conclusively shown that colchicum owes its activity to a principle essentially different.

In the American Journal of Pharmacy, Vol. 29, page 235, is a translation of an article by L. Oberlin, who states that he has obtained from meadow saffron seeds a white, crystallizable, neutral principle containing nitrogen, which he calls colchicine, and which although in some of its reactions it resembles colchicia, with other reagents it behaves very differently from that substance. One very characteristic distinction is the fact that this colchicine is not precipitated by tannic acid, and does not affect reddened litmus paper; properties which cut it off entirely from the class of vegetable alkalies. L. Oberlin appears to consider this neutral substance as the real active principle, and to doubt the existence of an organic alkaloid in the plant; but I think the following experiments will show that the activity of

the corms depends in part at least on the presence of the alkaloid colchicia.

In the same Journal, Vol. 27, page 539, is a translation of a very interesting account of a case of poisoning by tinct. sem. colchici, together with some tests for colchicia reported by Dr. Casper.

So far as I am informed, all those who have published investigations on the subject of colchicum since the time of Pelletier and Caventou, have selected the seeds to experiment on, and have bestowed but little attention on the corms. Prof. K. Schroff, makes use of the following language as lately as the middle of the year 1856. "The symptoms of poisoning by the fresh and dried bulbs being alike with those produced by colchicine, this principle is to be regarded as the really active principle, though up to the present time it has not been prepared yet from the bulb." (*American Journal of Pharmacy*, Vol. 29, page 324.)

A large number of experiments were performed to discover, if possible, the best method of isolating colchicia. The following process was found easy of application and afforded a tolerably satisfactory result. A portion of dried English corms was reduced to coarse powder, packed in a displacement apparatus, and slowly percolated with alcohol s. g. .835 until nearly exhausted. The resulting tincture was evaporated by means of a water bath until it assumed the consistence of a syrup; it was then poured into about ten times its bulk of cold water acidulated with acetic acid and strongly shaken; an abundant precipitation of soft resin took place, which was removed from the liquor by straining through calico. The liquid was evaporated to about one half the bulk of the root operated on; and, when cold, solution of ammonia was added as long as a precipitate was formed. This precipitate was collected on a filter, strongly pressed between folds of bibulous paper to remove as much as possible of the adhering dark liquid, and then dissolved in absolute alcohol, boiled with a very little animal charcoal, filtered, and evaporated at a gentle heat. The product answered to the tests given for colchicia, but it was contaminated with a brown coloring matter difficult to remove, and contained a small portion of a substance which slightly modified its reaction with some tests.

The alkaloid was afterwards obtained in a state of greater purity and more plentifully by the following method.

Three pounds of the dried English corms were, as in the former process, exhausted by alcohol, the tincture evaporated to a syrup, thrown into water acidulated with acetic acid, and the solution filtered. Solution of ammonia was added to the liquor until it was nearly neutral, and then solution of tannin as long as a precipitate was formed. The insoluble tannate was separated from the residual liquor by filtration, well washed with water, and while still moist, thoroughly triturated with at least five times its weight of freshly prepared hydrated oxide of lead. Small portions of alcohol were added from time to time during the trituration, until the quantity amounted to twelve fluid ounces. The whole was then thrown on a filter, and the filtered liquid evaporated at a gentle heat. Twenty grains of nearly white colchicia were obtained from the three pounds of root employed.

As thus obtained colchicia is in the form of a yellowish mass which becomes nearly white when powdered, inodorous, of a bitter taste without sharpness or acrimony. It is not sternutatory: a portion was snuffed up the nostrils and occasioned no immediate effect, but after some time an unpleasant feeling of dryness in the nasal passages was experienced, followed by a discharge of thin mucus slightly tinged with blood.

It is quite soluble in water, both cold and hot, and still more soluble in dilute acids; very soluble in absolute, officinal, and dilute alcohol, both cold and hot; sparingly and slowly soluble in pure ether, but quite soluble in commercial ether containing alcohol; very soluble in chloroform, and apparently insoluble in benzole. It is freely taken up by aqua ammoniæ and dilute liquor potassæ.

I have not succeeded in crystallizing this principle. A solution in alcohol allowed to evaporate spontaneously leaves the colchicia as a varnish like mass; and a precisely similar result is obtained if chloroform or commercial ether be substituted for alcohol. A solution in distilled water or very dilute alcohol, when exposed to the air, deposits the alkaloid as a flocculent precipitate devoid of crystallization.

It restores the blue color to reddened litmus paper if moistened and laid on it, and a portion added to an infusion of litmus, red-

dened by a minute quantity of sulphuric acid, completely restores the blue color to the liquid. It neutralizes the strongest acids, and forms with sulphuric acid, a salt which I think is evidently crystalline when examined with a microscope. These properties give it an unquestionable right to be classed among the vegetable alkaloids.

In the dose of 1-10th of a grain colchicia produced a purgative effect, accompanied by a great deal of nausea and distress. A decidedly sedative influence on the circulation was experienced during its operation; the pulse being reduced from eighty-six to seventy strokes per minute.

The following list of tests for colchicia has been prepared with a considerable amount of care, and in those cases in which a different result was obtained from that previously published by other writers, the experiment was repeated several times, in order to guard against error from accidental causes.

In a solution in distilled water :—

Tannin,—a white precipitate, soluble both in dilute acids and dilute alkalies.

Iodohydragryrate of potassium,—a white precipitate.

Aqueous solution of iodine,—a bulky brown precipitate.

Chlorine water,—no immediate effect, but after a few seconds a white cloud is produced; ammonia added dissolves it with a light brownish color; a small portion of ferrocyanide of potassium added before the ammonia does not alter the effect.

Red oxide of mercury dissolved in solution of iodide of potassium,—an immediate white precipitate, soluble in excess.

Ammonio-sulphate of copper,—a greenish color; after a time a light green precipitate subsides.

Sulphuric acid,—a clear yellow color.

Nitric acid,—a clear yellow color.

Both neutral and subacetate of lead,—no precipitate or coloration.

Bichromate of potassa,—no precipitate or coloration.

In a solution in dilute muriatic acid :—

Ammonia,—a white precipitate, soluble in excess.

Terehloride of gold,—a yellow precipitate.

Bichloride of platina,—a yellow precipitate.

Tinct. ferri chlorid.—no precipitate or coloration.

Dissolved in dilute acetic acid, and tincture of iodine added, a brown precipitate, dissolving on the application of heat and depositing again as a brownish flocculent precipitate as the liquor cools; ammonia added to the liquid while hot prevents this deposit.

When rubbed up in a mortar with cold concentrated sulphuric acid it dissolves, forming a clear solution of an intense yellow color; a fragment of bichromate of potassa added, a purplish color passing into dirty green is produced.

A fragment of nitrate of potassa added to the solution in sulphuric acid, causes a beautiful blue color, changing to green, then greenish black, dark brown or purple, light brown, and finally reddish yellow, which last color is permanent for at least twelve hours. These colors merge into one another rapidly and form a very beautiful experiment.

Rubbed with ordinary commercial nitric acid, a clear yellow solution is formed; but if strong red fuming nitric acid be employed, a change of colors is produced very similar to that caused by sulphuric acid and nitrate of potassa.

The most delicate of these appears to be the sulphuric acid and nitre test. I have obtained a satisfactory reaction with less than 1-5000th of a grain of colchicia in this way. The most delicate test for colchicia in solution that I have tried is tannic acid, but the delicacy of this reaction is much impaired where a solution of a salt of colchicia is employed instead of the alkaloid itself, for the tannate, although almost absolutely insoluble in pure water, is dissolved pretty freely by dilute acids.

By these tests colchicia may readily be detected in cases of poisoning. The stomach of a cat which had been killed by a dose of colchicia, was cut into small pieces and macerated in eight fluid ounces of alcohol, s. g. .835, for twelve hours, filtered and evaporated at a gentle heat to dryness. The extract-like matter thus obtained was treated with one fluid ounce of boiling distilled water and the solution filtered. Portions of this liquid yielded the following indications of the presence of colchicia:—tannin, a white precipitate; chlorine water, a white cloud; and ammonio-sulphate of copper, a green precipitate by standing. A

portion of the liquid evaporated to dryness, yielded with sulphuric acid and nitre, the characteristic change of colors in a very satisfactory manner.

Colchicia cannot be distilled unchanged. When heated in a small tube retort it fuses, and is decomposed at a heat below redness, giving off combustible gas and leaving a bulky shining black coal, full of vesicles, in the retort. If cautiously heated on a slip of platina foil it first melts, without decomposition, into a clear liquid, which if allowed to cool forms a transparent glass, but if the heat be raised it inflames and burns with a white smoky flame, leaving a small amount of coal, which is readily dissipated by a continuance of the heat. A mere trace of a spot is left on the foil, showing the position of the alkaloid before decomposition.

Considerable annoyance was experienced in the purification of colchicia from coloring matter, on account of the great loss always sustained when it was brought in contact with animal charcoal. Even an alcoholic solution of the sulphate was deprived of a considerable portion of its colchicia by boiling for a few minutes with purified animal coal; a still larger proportion was lost when an alcoholic solution of the uncombined alkaloid was treated in this manner; and a watery solution of the acetate was almost entirely deprived of bitterness by agitation in the cold with a portion of freshly prepared ivory black. This property of animal charcoal would suggest the propriety of its administration in cases of poisoning by colchicia or preparations of colchicum; and as it is perfectly harmless very large quantities might be swallowed without any inconvenience resulting from its use. Of course it would not be a perfect antidote, but might serve as a palliative until the stomach could be emptied by the usual means.

It was thought possible that a derivative alkaloid might be obtained from colchicia by distillation with caustic potassa, but although the experiment was carefully performed in an atmosphere of carbonic acid, no indication of the presence of an alkaloid could be obtained in the distillate.

ON THE PREPARATION OF COLLODION.

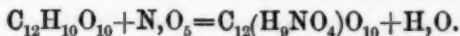
By OLIVER G. SHERMAN.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy, 1858.)

Although collodion is extensively used in the arts, and, to a more limited extent, in surgery, yet the chemical changes and causes of disappointment in its preparation are little understood; thereby rendering its manufacture one of much trouble and perplexity, and oftentimes resulting in entire failures. I do not design to enter fully into the rationale of the minute chemical changes which take place, but simply to notice some of the causes which most frequently give rise to disappointment, and to give a practical formula, so that pharmacutists may meet with success when they undertake its preparation. This formula I shall endeavor to construct in accordance with a few rules, which have been found necessary to follow.

To the kindness of my friend, Mr. Benj. J. Crew, I am indebted for much of my knowledge of this preparation, and with his approbation have instituted this article. During my experiments to obtain a soluble cotton, I have taken particular notice of the different textures and solubilities which resulted, and have found that they were modified according to the strength and temperature of the nitro-sulphuric acid used. The formula of the U. S. Pharmacopœia, directs the use of nitrate of potassa; this process is constantly causing unsatisfactory results, and, at the present time, is almost entirely abandoned, when made in large quantities, for that of the two acids. My experiments were made with the latter, and I shall, therefore, confine my remarks accordingly. Much depends on the strength of these acids. The temperature of those of a proper strength, when mixed, should rise from 70° F. to about 135° F.; this temperature being necessary to effect a soluble cotton. But the temperature alone, to which they rise, is no criterion for success, unless their specific gravities and temperatures were previously noticed. When cotton is added to nitro-sulphuric acid, the following is thought, by some authorities, to be the chemical change: The nitric acid undergoes decomposition; while the cotton, a change of substitution. One equivalent of nitric acid is decomposed into one equivalent of peroxide of nitrogen (NO_2), and one of oxygen;

the peroxide displaces one equivalent of hydrogen from the cotton, forming soluble cotton, while the hydrogen combines with the equivalent of oxygen from the nitric acid, forming one of water. The change expressed in symbols will render it more simple :



When the nitro-sulphuric acid is too strong, and the cotton remains in for some time, it is thought to have been combined with two equivalents of the peroxide ; thus rendering the cotton insoluble and very explosive. My experience has forced me to believe that, instead of there being only two varieties, the soluble and the insoluble, or explosive, there are varieties of every degree of solubility, from the perfectly soluble to the entirely insoluble. This difference in solubility is due, probably, to the cotton not being properly acted upon, and at improper temperatures.

I have made the following experiments to show the different textures and solubilities resulting with nitro-sulphuric acid of different strengths :

Experiment 1st.—To half a fluid ounce, each, of commercial sulphuric acid and fuming nitric acid, sp. gr. 1.45, mixed, was added 30 grains of finely carded cotton, which, after remaining in the mixture for ten minutes, was taken out and washed thoroughly with an abundance of water, until no acid was perceptible. The fibre of this cotton was strong and perfect, without being matted, and washing with ease. After picking apart, drying, and again weighing, I found it had gained 17 grains, or 56½ per cent. ; it was partially soluble in ether, or a mixture of ether and strong alcohol, in the proportion of 5 parts of the former to 3 of the latter, the insoluble portion settling to the bottom in a semi-gelatinous form. A small portion of the alcohol and ether solution, dropped upon glass, spread evenly and dried into an adhesive, transparent film. This variety is slightly explosive, leaving a trace of carbonaceous substance. The temperature of the acids, before mixing, was 74°; after, 120° F.

Experiment 2nd.—To the same quantity of sulphuric acid, as in experiment 1st, was added a mixture of three drachms of fuming nitric acid and one of water ; the temperature now rose from 74° to 158° F. To this mixture, 30 grains of cotton was added, and at the end of ten minutes was taken out, and found to wash with much difficulty, being much matted, and having a

short, rotten fibre. When dry, it was found to have lost 14 grains in the operation. This cotton was perfectly soluble, making a limpid collodion when dissolved in ether, or alcohol and ether, and leaving a transparent film when dropped upon glass. It is not explosive, but burns quietly. This formula, though one of much loss to the manufacturer, will sometimes make a soluble cotton, but it does not thicken, or give the collodion a mucilaginous appearance, to the desired extent. There is danger when the cotton is added, of its taking fire and being entirely consumed, unless carefully watched.

Experiment 3rd.—A mixture was made with three drachms of nitric acid and five of sulphuric, which increased from 74° to 120° F.; 30 grains of cotton, treated as in the former experiments, was found to have gained 20 grains, entirely insoluble at first, but after remaining in a mixture of alcohol and ether a few days, it changed into a partially gelatinous mass. This cotton is very explosive, leaving no residue; harsh to the touch, and to all appearances had undergone no change. The above experiments are quite sufficient to show the most prominent varieties which result during the temperature of summer.

In my 1st experiment, the nitro-sulphuric acid was rather too strong, thus rendering the cotton slightly explosive and only partially soluble.

In my 2nd, the acid was much too weak, causing the cotton to be partly dissolved in it, and the fibre to be short and matted, and not difficult to pulverize when dry.

My 3rd shows that the acid was entirely too strong, making the cotton insoluble and very explosive, gaining much in weight, with a perfect fibre. Frequent experiments have shown that the acids may be of the right strength, and mixed in correct proportions, but unless the temperature of them be of such a degree as to cause the nitro-sulphuric acid to rise to 130° or 135° F., the cotton will not be perfectly soluble. The rise of the temperature to the above degree, when the acids are mixed, seems to cause a change necessary to effect a soluble cotton. Before going further, it will be necessary to undertake a few experiments to show if it is absolutely required, in effecting a soluble cotton, for the temperature of the acids, when mixed, to rise to 130° or 135° F., and also if it is necessary to add the cotton during this high temperature, or after it has cooled.

Experiment 4th.—With ice, the temperature of the acids was brought to 32° F.; I then mixed them in correct proportions, and found the temperature to rise to 112° F. The cotton was now added, and the mixture put aside for ten minutes; it was then taken out and thrown into a quantity of water and well washed. This cotton washes well, and has a strong nearly perfect fibre, with a slightly yellowish appearance. With ether, or alcohol and ether, it forms a gelatinous mass, which is partly dissolved after remaining for some time. It increased in weight about 40 per cent., and burns quickly, without explosion.

Experiment 5th.—I made a nitro-sulphuric acid of the right strength, and the temperature rose a few degrees above 135° F. After the acid had cooled to the temperature of the room, I added the cotton, and treated as in experiment 4th. This gained 50 per cent., and was slightly explosive and partially soluble. The collodion made from this cotton, will nearly always have minute fibres suspended in it, which settle only with much difficulty. The foregoing experiments are sufficiently conclusive to evince the necessity—first, to have the nitro-sulphuric acid of the proper strength; secondly, that the acids, before mixing, should have the temperature of at least 65° F.; and thirdly, that the cotton should be added directly after the acids are mixed, or when the thermometer indicates about 130° F.

By strictly observing these rules all the causes of disappointment are obviated, and the result will be a perfectly soluble cotton. It now remains to give a formula for its preparation, and, in doing so, I give one that many experiments have proved to be successful. It is as follows:

Fuming nitric acid (sp. gr. 1.45),	} of each, one
Sulphuric acid (commercial),	
Water,	one fluid drachm,
Cotton (carded),	sixty grains,
Ether (commercial),	twelve fl. ounces.

or:

Fuming nitric acid (sp. gr. 1.42),	} of each, one
Sulphuric acid (commercial),	
Cotton (carded),	sixty grains,
Ether (commercial),	twelve fl. ounces.

Should its preparation be during winter, the first duty would be to raise the temperature of the acids to between 65° and 75° F.; add the water to the nitric acid, and then mix with the sulphuric, stirring with a glass rod. Notice the temperature now, and if it is near 130° F., add the cotton slowly, with the rod, so as to have it completely saturated; let it remain from five to ten minutes, then remove to a large quantity of water and wash thoroughly for five minutes. Pick it well apart, and dry by exposure to a dry atmosphere, or dehydrate with strong alcohol. To the product, thus obtained, add the ether and shake briskly until dissolved.

The manipulation of the second formula is in the same manner; the water being replaced by that in the nitric acid of less specific gravity used. By either of the foregoing processes the cotton increases about 43 per cent. and is not explosive. I have noticed, where the increment is more or less than the above, unless dissolved by the acid, it would produce an unsatisfactory cotton. The twelve fluid ounces of collodion of the above processes ought to contain, with an increment of 43 per cent., 86 grains of soluble cotton, which is sufficient to render it of a consistency well suited for surgical purposes.

COLLODION IN PHARMACY.

By JAMES T. SHINN.

As a general thing, plasters are disliked by physicians, patients, and apothecaries; by the first, because so often they do not equal their expectations; by the second, on account of difficult application; and by the last, for their troublesome preparation. Collodion, on account of its perfect adaptability to uneven surfaces, easy application, cleanliness and adhesion, is an excellent vehicle for the exhibition of many external remedies, when the softening effect of ointment is not required. Iodine applied in this article is decidedly more active than the tincture; while even insoluble substances, such as sulphur and carbonate of zinc, act equally well as in the corresponding ointments. The cotton film gradually wears off, or if required, may be easily removed by a towel moistened with alcohol or Cologne

water. To prevent unpleasant contraction, Venice turpentine, or balsam of fir, should be added to the collodion, in the proportion of half an ounce to the pint. The following formulas are offered as having proved satisfactory :

Iodinal Collodion.

Take of Iodine, . . .	half an ounce.
Balsam of Fir, . . .	half an ounce.
Collodion, . . .	a pint.

Dissolve the iodine and balsam in the collodion. This preparation I have made for two or three years past, and it has proved very efficient and well adapted to the discussion of swelled joints, &c. The film of cotton and balsam seems to direct the action inwardly, as, when made of the same strength as the tincture, vesication is produced.

Belladonnal Collodion.

Take of Select Belladonna Leaves, powd.	eight ounces.
Ether,	twelve fluid ounces.
Alcohol, 95 per cent. . . .	a sufficient quantity.
Balsam Fir,	half an ounce.
Collodion Wool,	a drachm.

Macerate the leaves in the ether mixed with four fluid ounces of alcohol, for six hours, pack in a percolator and pour on alcohol until a pint of tincture is obtained; in this dissolve the cotton and balsam. The collodion so obtained is of very dark color, with a strong odor of belladonna, and has the advantage over the plaster of adhering perfectly. A colorless collodion may be made with Atropia, possessing similar properties, and more desirable when to be applied to the face or other exposed parts.

Aconite and Conium may be treated in a similar manner, care being taken to have the aconite root in fine powder. An aconital collodion, containing a small portion of cantharides, gave decided relief in a case of severe rheumatism.

Sulphural Collodion.

Take of Sublimed Sulphur, . . .	two ounces.
Balsam of Fir,	half an ounce.
Collodion,	a pint.

Mix.

Iodo-Sulphural Collodion.

Take of Iodine,	half an ounce.
Sulphur,	a drachm.
Balsam of Fir,	half an ounce.
Collodion,	a pint.

Mix.

These furnish an elegant method of exhibiting sulphur and iodine, far more cleanly than when mixed in ointment, and without the intensely disagreeable smell of that preparation; while in many cases of skin diseases there is an advantage in the coating of cotton. It is unnecessary to use iodide of sulphur, as the collodion decomposes it, dissolving the iodine while the sulphur is precipitated. Of course the bottles must be well shaken before applying the liquid.

Formulas for other similar preparations may occur to the apothecary, the foregoing being given to call attention to the method. The collodions should be dispensed in small vials with a camel's hair pencil inserted in the cork.

Philadelphia, 4th month, 1858.

ON FORMIC ACID.

By EDWARD R. FELL.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy, 1858.)

Having had occasion lately to make some formic acid to supply an order, and becoming interested in the results, I concluded to make it the subject of my thesis.

When wood is subjected to destructive distillation, there is obtained, in addition to other products, a volatile inflammable liquid, mixed with acetone, aldehyd, and other substances, called pyroxylic spirit, (impure methylic alcohol,) which can be purified by successive distillations with lime.

Having some impure pyroxylic spirit at my disposal, I proceeded to make some pure methylic alcohol. The formula used was that given in the American Journal of Pharmacy, vol. xxv. Half a pound of the impure spirit was mixed, very gradually, to prevent over-heating, with half a pound of strong sulphuric acid. When cool, one pound of binoxalate of potassa was added to the mix-

ture, and allowed to stand for a day or two, and then distilled. The distillation was continued until the residue in the retort was almost dry. Towards the end of the distillation, crystals of methyloxalic ether began to form in the neck of the retort. The distillate, which amounted to about ten fluid ounces, being exposed to the air for a day or two to evaporate spontaneously, became an almost solid mass of crystals of the ether.

These crystals were of a beautiful white color, dissolved in water, alcohol and ether, were decomposed by boiling with water, and the solution by evaporation yielded fine crystals of oxalic acid. By passing dry ammoniacal gas over a portion of the ether, and then dissolving the product in alcohol, and evaporating, a beautifully crystalline compound is obtained, to which the name of methyloxamic ether has been given. The remainder of the crystals, as first obtained, were pressed between the folds of filtering paper, and by exposition over sulphuric acid were deprived of adherent volatile products, (this treatment changed their color to a light brown,) and then distilled with water; the distillate was then distilled three successive times with lime, and afforded methylic alcohol almost entirely free from water. It was a light colorless liquid, having a faint odor of acetic ether, burned in the air with a faint blue flame, and resembled in its solvent powers those of ordinary vinic alcohol. The formula $C_2H_4O_2$ is given for it.

Methylic alcohol is oxidized rapidly when dropped on platina black, (especially if the temperature be elevated,) at the expense of the oxygen of the air, and formic acid is formed. Methylic alcohol, $C_2H_4O_2$, by gaining O_4 from the air, becomes $C_2H_4O_6$, and by giving off 3 eq. of water, becomes $C_2HO_3 + HO$, or formic acid. This is precisely the same reaction that takes place when alcohol is converted into acetic acid. Formic acid is also produced when many organic substances are subjected to oxidizing agents.

A good formula for making this acid, is that given in the Journal, vol. xxviii. One pound of oxalic acid was mixed with one pound of glycerin and three ounces of water, and the whole kept at a temperature of 212° F. for 15 hours, (the temperature should not be allowed to get much above this point, as the acid itself might be decomposed,) or until the oxalic acid was entirely

decomposed. Oxalic acid subjected to the action of heat, is converted into water, carbonic acid, and oxide of carbon. The water and oxide of carbon contain the elements of formic acid, and are made to combine through the intervention of glycerin, while the carbonic acid is given off. A quart of water was now added, and the whole distilled; another quart was added, and again distilled; the distilled products, containing the acid in a dilute state, were saturated with milk of lime, and evaporated to dryness, yielding six and a half ounces of formiate of lime. This was placed in a retort, five and a quarter ounces of pure sulphuric acid, and two and a quarter ounces of water added, and the whole distilled, until the distillate measured six fluid ounces. The acid as thus obtained had a suffocating odor, like that of sulphurous acid, and had the sp. grav. 1.104. The glycerin used in the operation was merely discolored, and was used again in forming fresh portions of the acid.

Formic acid was obtained at the highest degree of concentration by passing dry sulphuretted hydrogen over dry formiate of lead contained in a long glass tube, until the lead salt was entirely decomposed. By applying a very gentle heat to the tube, the formic acid was driven into a small receiver. This acid was so caustic as to raise a blister when dropped on the skin, and had the sp. grav. 1.125.

I combined several of the alkaloids with formic acid. Formiate of strychnia was obtained in fine silky crystals, quite soluble in hot and cold water, sparingly so in alcohol and ether, and gave the characteristic violet color with chromic acid. Formiate of brucia was obtained in crystals slightly soluble in hot and cold water and alcohol, almost insoluble in ether. According to Larocque and Thiebierge, the salts of brucia give first a milky, then a coffee colored, and finally a chocolate brown precipitate with chloride of gold. This reaction was manifested with the sulphate; but with the formiate it gave first a yellow precipitate, gradually changing to a dirty green. With nitric acid this salt gave a fine crimson color. Formiate of cinchonia was obtained in crystals, soluble in hot and cold water, and gave with the tests the same reactions as the other salts of cinchonia. Formiate of morphia was not crystallizable, but only formed in white crusts, and gave the fine blue color with sesquichloride and salts of the sesqui-

oxide of iron. Formiate of beeberrine was not crystallizable, but formed in shining brown scales, soluble in alcohol; less so in ether and water. Formiates of baryta and strontia (made by dissolving the carbonates in the acid) were obtained in beautiful lustrous crystals, were not altered by contact with the air, and were quite soluble in water. Formiate of copper (made by dissolving the carbonate in the acid) formed in light blue crystals, quite soluble in water. Formiate of cobalt, made as above, formed in fine rose colored crystals, quite soluble in water. Formiate of nickel is said to be crystallizable, but in many trials I was not able to obtain it in crystals. Formiate of uranium (made by dissolving the yellow oxide in the acid) was obtained in fine yellow crystals.

The above experiments were made, more with a view to the interest they afforded to myself, than with the expectation of eliminating any thing new in regard to the subject.

ON FLUID EXTRACT OF SANGUINARIA.

By SAMUEL CAMPBELL.

Having been requested by a physician to make a preparation of Sanguinaria, containing all the active principles, in a concentrated form, (to my knowledge no formula for a fluid extract has yet been published*), I have devised one, and offer the following process:

Take of Sanguinaria Canadensis,	.	.	8 oz.
Acetic Acid, No. 8,	.	.	2 oz.
Water,	.	.	10 oz.
Sugar,	.	.	8 oz.
Diluted Alcohol,	.	.	q. s.

Having reduced the root to a coarse powder, I then incorporated it with the acetic acid, previously mixed with the water. After allowing it to macerate for forty-eight hours, it was transferred to a glass percolator, and exhausted by means of diluted alcohol. By means of a water bath the tincture was evaporated to twelve fluid ounces, the sugar added, and, when dissolved, strained.

[* A formula for an acetic syrup of Sanguinaria was published in this Journal page 108, Vol. 2nd, 3rd series, (1854), by T. S. Wiegand—of the strength of four ounces to the pint.—EDITOR.]

The preparation is of a deep red color, with an intensely acrid taste. Each fluid drachm represents thirty grains of the root.

Philad., April, 1858.

ON A CONTRIVANCE FOR DISPENSING OILS.

To the Editor of the Journal of Pharmacy:

SIR:—If you think the following worth an insertion you can make use of it.

The constant annoyance occasioned by the necessity of almost hourly cleansing the shop bottles from which castor oil, &c., are dispensed, led me to design the following simple method of obviating the difficulty. Select a tincture bottle with a wide lip, slightly elevated on its external circumference; in the mouth of this fit, by grinding, a piece of thick glass tube about two inches long; when fitted, file off slightly one side of the convex surface of that part of the tube fitted into the neck, and fasten the tube with any kind of cement *insoluble* in the contents of the bottle. The drop of oil or other liquid left after each pouring falls on the lip, and passes back into the bottle. I have fitted my own castor oil and hair oil bottles, and molasses jug of the family, on this plan, and they have not required cleaning since, from the soiling of the contents. I use the necks of olive oil bottles for tubes, and collodion for cement. They do not require flattening, as the imperfection of the circle leaves sufficient room for the oil to pass. This is a trifling matter; but if druggists would communicate such simple devices to each other, we should soon acquire a stock sufficient to form an addendum to Faraday's Manipulations.

A CONSTANT READER.

ON HYPOPHOSPHITE OF LIME.

By E. SCHEFFER.

When the hypophosphites first came in use, I followed the usual method, to make hypophosphite of lime, by boiling the phosphorus with lime. Every one who has made this prepara-

tion will have found it a tedious, troublesome and disagreeable process, wherefore I have made several experiments, to make it in another way, in which at last I succeeded.

According to Paul Thénard, oxide of phosphorus, when heated with milk of lime, gives hypophosphite of lime, and not self-inflammable phosphoretted hydrogen. This gave me the idea to the following way :

I took phosphorus, melted it under water, and passed atmospheric air into it, from a gasometer. The phosphorus will burn under the water, and soon begins to swell up. I continued to let atmospheric air go to it, until I hardly could see any more fire under the water, and then let it cool. When taken out of the water, the phosphorus has a spongy appearance of at least four times its original volume, does not so easily ignite, and at a medium temperature it can be left in the air without there being any danger of fire. I cut this so prepared phosphorus, which I consider a mixture of phosphorus with oxide of phosphorus, into pieces, and put it into milk of lime, which I made by slacking lime with six times its weight of water. In a one gallon pot I put eight ounces phosphorus, twelve ounces lime, and seventy-two ounces of water. The action of the lime on the phosphorus soon commences by evolving gas bubbles, takes place at any temperature, even at the freezing point, but acts the quickest at about 130° F. The gas bubbles consist mostly of hydrogen and not self-inflammable phosphoretted hydrogen ; but now and then some bubbles rise which explode in the air.

This method has the advantage, that it yields more than the boiling process, which I think is owing to the lower temperature at which the reaction takes place. Out of two ounces of phosphorus, with which I first experimented, I got two and a half ounces of hypophosphite of lime, and yet not all the phosphorus was dissolved. I am sure that by bringing the process to an end, one part of phosphorus will give one and a half part of hypophosphite of lime. Do I want to get some hypophosphite before the process is ended, I just let the phosphorus with the lime settle, take off the liquid with a siphon, and replace it with water, and the formation of hypophosphite will continue.

Another advantage is, that very little inflammable phosphoretted hydrogen is formed, and that the smell is not so offensive ;

besides the process does not need to be watched all the time ; to be stirred occasionally is all that is required.

I did not examine whether any phosphate of lime is formed, and if there is any, how much ; but, no doubt, its quantity is not considerable, as the yield in hypophosphite is so much greater. By boiling the phosphorus with lime, I am sure it is for the most part the excess of lime, which, by a boiling heat, decomposes hypophosphite already formed, and converts it into phosphate with evolution of hydrogen gas, and that this is the reason why the product is so little.

Louisville, Ky., April 4, 1858.

COMPOUND SYRUP OF PHOSPHATES.

By E. SCHEFFER.

According to the formula given in the last number of the Journal of Pharmacy, 1857, the Compound Syrup of Phosphates should contain, besides the other ingredients, twelve drachms of phosphate of lime, dissolved in twenty drachms of glacial phosphoric acid. If the glacial phosphoric acid in commerce was always PO^5 , HO—the monohydrate of phosphoric acid—the formula would be all right, but as it contains mostly more water than the monohydrate, the syrup will always vary more or less in its quantity.

I propose, therefore, a method which does not interfere at all with the formula given by Mr. Parrish, and does not alter the proportion of the ingredients, but which will always give the same compound, and which will recommend itself by being a great deal cheaper and very easily made.

I start with the supposition, that twenty drachms of glacial phosphoric acid in that formula shall be the monohydrate of phosphoric acid.

Twenty drachms of PO^5 , HO correspond to 17.76 PO^5 , anhydrous phosphoric acid. These 17.76 PO^5 are contained in 37.25 phosphate of lime, and 37.25 phosphate of lime contain 19.50 lime, which require 34.125 drachms SO^3 , HO, the monohydrate of sulphuric acid, to form sulphate of lime.

I take now 49.25 drachms phosphate of lime, and 34.125 sul.

phuric acid, diluted with three times its weight of water, put them in a thin dish, and heat on the water-bath for half a day.* By this process only 37.25 drachms phosphate of lime will be decomposed by the sulphuric acid, which combines with the lime of these 37.25 drachms to form sulphate of lime, while the phosphoric acid gets free and keeps the other twelve drachms of phosphate of lime in solution. After being cooled, I separate the liquid from the sulphate of lime by means of a press, put some fresh water to the residue and press again, and so a second time. Should the liquid obtained measure more than twenty fluid ounces, I evaporate, let it cool, and afterwards filter, to separate from sulphate of lime, which might have crystallized out. In the clear liquid, I dissolve now the phosphate of iron, the carbonate of potash and soda in the quantity given by Mr. Parrish, which will dissolve readily without the use of muriatic acid; and then I make the syrup by adding and dissolving the sugar.

In this syrup the ingredients are all in the proportion that the formula demands; the quantity of sulphate of lime in it is so little, that it certainly does not speak against this method, as it cannot interfere with the medical properties of the phosphates.

This method, by making the preparation of so valuable a compound as, I think, the syrup of phosphates is, a great deal cheaper, is an item of no little importance.

Louisville, Ky., April 4, 1858.

ON FLUID EXTRACT OF LEPTANDRA VIRGINICA.

BY SAMUEL CAMPBELL.

The remedial properties of *Leptandra Virginica*, or Culver's Physic, having of late attracted considerable attention among the members of the medical profession, I have devised a formula for a fluid extract, and offer the following process, together with the reasons that led to its adoption. According to the Eclectic Dispensatory, the active principle is resinous in its character,

* The monohydrate of sulphuric acid is easily made by heating commercial acid in a China dish on the sand bath, until the acid begins to evaporate.

is soluble in alcohol 90 per cent., but partially soluble in ether; insoluble in water, but is rendered wholly soluble by the addition of either liquor potassa or ammonia. From these facts I inferred that alcohol and diluted alcohol with the caustic alkali would be the proper menstruum, and have accordingly adopted the following formulæ:

Rad. Leptandra . . .	8 oz.
Alcohol, 90 per cent. . .	12 oz.
Diluted alcohol . . .	q. s.
Liq. Potassæ . . .	1 oz.
Sugar . . .	8 oz.

Having reduced the root to a coarse powder, and after allowing it to macerate in the strong alcohol for 48 hours it was transferred to a percolator and exhausted by means of diluted alcohol previously mixed with the liquor potassæ. It was then carefully evaporated over a water bath to 12 fluid ounces, the sugar added, and when dissolved, strained.

The resulting fluid extract is of a deep reddish brown color, possessing a bitter nauseous taste. Great care is necessary in the evaporation of the displaced liquor in not employing too great a heat, or otherwise the resin will precipitate and be rendered insoluble. Each fluid drachm represents thirty grains of the root.

April 7th, 1858.

NOTE ON COMPOUND SYRUP OF HYPOPHOSPHITES.

By WILLIAM PROCTER, JR.

In the last number of this Journal (page 123) I published a paper in which this syrup was suggested. The experience which has since been gained in its preparation, leads to a modification of the amount of sugar and to some precautions in manipulation. When so much as twelve ounces of sugar is used to the pint, it is found to cause the precipitation of a portion of the calcareous hypophosphite, sometimes as a cloudiness, and sometimes as a considerable precipitation. Also, that when otherwise perfect, the use of fluid extract of vanilla will cause a

cloudiness, especially if it is much alcoholic. The following is the revised formula :

Take of Hypophosphite of lime	256 grs.
Hypophosphite of soda	192 grs.
Hypophosphite of potassa	128 grs.
Hypophosphite of iron* (recently precipitated)	96 grs.
Hypophosphorous acid, solution, q. s. or	240 grs.
Syrup of vanilla	half a pint.
Boiling water a sufficient quantity.	

Put the lime, soda, and potassa salts in a large mortar, add the hypophosphorous acid and mix, then the moist hypophosphite of iron, and triturate till a uniform smooth mixture results. Four ounces of boiling water is now poured in, and after trituration, the clear liquid is decanted from the undissolved portion to a filter, and more water added till it is dissolved and the filtered liquid amounts to eight fluid ounces. To this solution, while still warm, add the syrup of vanilla *previously acidulated* with a few drops of solution of hypophosphorous acid, and mix.

As stated before, each teaspoonful contains 2 grs. of the lime salt, $1\frac{1}{2}$ grs. of the soda salt, 1 gr. of the potash salt, and $\frac{3}{4}$ gr. of the iron salt, with a little free hypophosphorous acid. The small proportion of sugar in this preparation almost deprives it of the right to the name of syrup, but it is sufficient for its preservation and renders it agreeable.

Since the publication of my former article this syrup has been used by several physicians in cases of a pulmonary character, with tendency to hemorrhage, loss of appetite and cough, with very decided benefit. In one instance the patient was much emaciated, with cough and loss of appetite, but recovered his flesh and strength under its use.

* This quantity, ninety-six grains, of hypophosphite of iron is obtained, When 128 grs. of hypophosphite of soda, dissolved in 2 fluid ounces of water, is decomposed with a slight excess of solution of persulphate of iron, and the whole precipitate well washed on a filter with water.

OSBORNE'S SYRUP.

[The following formula for Osborne's Syrup has been sent to us by R. B. Saunders, of Chapel Hill, N. C., who says: "I think it is one of the most valuable preparations that can be made for children; nothing can excel it. It is also very useful for diseases of the bowels in summer. Large quantities of it are used in this part of the State.—ED. AM. JOURN. PHARM.]

R Rad. Rhei Cont.	3xi $\frac{1}{4}$.
Sem. Anisi	3xi $\frac{1}{4}$.
Rad. Glycyrrh.	3xi $\frac{1}{4}$.
Aquæ Bullienti	3xlvi.
Mannæ	3ij $\frac{13}{16}$.
Tr. Opii Camp.	3ij $\frac{13}{16}$.
Sal. Tartari	grs. 225

Simmer the first four articles over a slow fire till reduced to two-thirds; then add the manna and strain. Make a syrup with 4 $\frac{1}{2}$ lbs. (Troy) white sugar; then add the paregoric and sal. tartar, and, in warm weather, a wine glass of French brandy.

ON THE INFLUENCE WHICH LIQUOR POTASSÆ AND OTHER
ALKALIES EXERT UPON THE PREPARATIONS OF
HENBANE, STRAMONIUM, AND BELLADONA.

By A. B. GARROD, M. D.

Physician to University College Hospital.

Delivered before the Royal Medical and Chirurgical Society, Tuesday, November 24th, 1857, Sir Charles Locock, Bart., President, in the Chair.

The author first alluded to the frequent exhibition of henbane with liquor potassæ, and brought forward many proofs that such combinations were often administered. He also stated that the like mixtures were recommended by both medical and surgical authors. Dr. Garrod then proceeded to detail experiments which demonstrated beyond doubt that the active principle of henbane was destroyed by liquor potassæ and other caustic alkalies; and that such a combination was inert, both when topically applied (as evidenced by the absence of power in causing dilatation of the pupil of the eye), and also when internally administered. Similar observations were next detailed upon the preparations of stramonium and belladonna, and the results were found to be

the same. It was, however, shown that the carbonates and bicarbonates of the alkalies were devoid of the property of destroying the activity of the plants. In some of Dr. Garrod's experiments as much as a drachm of the extract of henbane and an ounce and a half of the tincture were administered in combination with potash, without the production of the slightest symptom.

The results arrived at in the communication may be thus summed up:—

1st. Caustic alkalies, such as exist in liquor potassæ or liquor sodæ, entirely destroy the activity of henbane, preventing its action on the pupil when topically applied, and its influence upon the system when internally administered; and, combined with a proper amount of these alkalies, the largest doses of the preparations of henbane may be given without the production of any symptoms.

2ndly. The same influence is exerted by the fixed caustic alkalies upon belladonna and stramonium.

3rdly. The carbonates and bicarbonates of potash and soda produce no injurious effects upon the preparations of any of the three above-named plants.

The deductions naturally to be drawn from these results are:—

a. That neither liquor potassæ nor any caustic fixed alkali should be prescribed with tincture or extract of henbane, as the virtues of the latter drug are thereby completely neutralized.

b. That when it is desirable to administer an alkaline remedy with henbane, either a carbonate or bicarbonate should be selected, which would probably be equally efficacious upon the stomach, if such influence be required, and certainly as efficient in altering the condition of the urine, and the mucous membrane of the urinary passages.

c. That the same precautions should be observed with regard to belladonna and stramonium, if at any time prescribed in conjunction with alkalies.—*London Pharm., Journ., March 1858.*

ON AMMONIO-OXIDE OF COPPER, A SOLVENT FOR
VEGETABLE FIBRE.

BY DR. ED. SCHWEIZER.

The author prepared basic hyposulphate of copper, 4CuO , S^2O^5 , by carefully precipitating a solution of hyposulphate of copper with dilute ammonia. The precipitate was filtered, washed, and then treated with strong ammonia, in which it very readily dissolved up to a dark blue liquid, from which, on cooling, crystals of cuprohyposulphate of ammonia, $2\text{NH}^3\text{CuO}$, S^2O^5 , were deposited. Hence by dissolving the basic salt in ammonia, there must have been formed some ammonio-oxide of copper which remained in solution.

This blue liquid has the very remarkable property of dissolving vegetable fibre at ordinary temperature.

When clean cotton is treated with this blue liquid, it soon assumes a gelatinous consistence, the filaments separate and disappear, and after some kneading with a glass rod, the whole is changed into a mucous liquid. No heat is given out in this operation. If sufficient liquid has not been employed, a portion of the fibre remains visible; but on adding an excess and agitating, it disappears, and an almost colorless solution is obtained, which after dilution with water may be filtered.

On supersaturating the solution with hydrochloric acid, a voluminous white precipitate is formed, which, collected on a filter, has the appearance of moist hydrated oxide of alumina. This appears to be nothing more than cellulose, which is disorganized, but not essentially altered in its chemical nature.

When the gelatinous precipitate, thoroughly washed from salts, is suspended in water, iodide of potassium added, and then a little chlorine-water, the liquid becomes brown, a proof that neither starch nor amylaceous substances are present. Dried on the water-bath, the precipitate diminishes in bulk, and leaves a horn-like, transparent, brittle mass, resembling dried starch-paste, but having no taste. Heated in the air, it burns away without residue.

Paper and *linen* are also dissolved, though somewhat more slowly than cotton; and the solvent power extends to some ani-

mal tissues. *Silk* dissolves even more easily than cotton, and acids precipitate from the clear solution a gelatinous body. *Wool* is only dissolved by the aid of heat. *Hair* is gradually decomposed by the liquid, but without effecting solution. *Bladder* swells at first, and afterwards dissolves. Starch is not dissolved by the liquid.

The solution of *basic sulphate of copper* in ammonia has the same properties as the above solution, and may, of course, be more easily prepared.—*Chem., Gaz., from Journ., für Prakt., Chemie., Feb., 1858.*

SUBSTITUTE FOR LARD IN OINTMENTS.

By JAMES J. T. W. SMITH.

In consequence of the objections to lard in the making of ointments, I was led to try an experiment, for the purpose of producing an ointment which would readily wash from a wound without the addition of soap or any other agency save water, of good consistency, not variable with change of temperature, easily miscible with substances soluble in water, and free from oxidation. As far as theory goes, I can see no evidence to show why the following formula could not be advantageously adopted:—

R. Powdered Fuller's Earth.

Glycerine aa ʒj, m

The fuller's earth should be in an impalpable powder, and to produce this with the least degree of trouble, I place a quantity of the earth in a dish, and pour a little water on it. In a few minutes it is perfectly slaked. Place it in the oven to dry. When perfectly dry, powder it, and pass it through a fine sieve. Of this powder and glycerine take equal parts, and mix thoroughly in a jar with a palette knife, *without* the aid of heat. Its consistency is perfectly under the control of the operator, as he can modulate the quantities of the earth or glycerine to suit his purpose. The *healing* and *non-irritating* qualities of fuller's earth need scarcely be alluded to, but it appears to form an item in its favor. I may also state that it is easily miscible with fats, if required. This appears to be owing to the peculiar solvent

action of the fuller's earth on greasy substances. It will not be so liable to irritate as starch, on account of the healing properties of the earth. The subject is worthy of investigation; and if those interested in the subject would consider the matter, I have little doubt but that there may be merits found connected with the formula which at first sight may not appear.—*Pharm. Journ. March, 1858.*

NOTE ON PUTREFACTION AT 35° C. (31° F.) BELOW ZERO.

By Mr. T. L. PHIPSON.

We are accustomed to regard the temperature of 15° to 25° C. (59° to 77° F.) as the most favorable to eremacausis, fermentations, putrefaction, &c. But these spontaneous alterations of organic bodies, although they seem no longer to exist at the freezing point, may, according to all appearance, be perfectly manifested at the temperature of 20° C. below zero (=4° F. below zero) that is to say when the cold is extreme. This was proved during Dr. Kane's last voyage towards the north pole,* in search of Sir John Franklin, during the years 1853-4-5. It appears that the flesh of certain animals, the rein-deer for example, was not eatable after a short exposure to the air, the temperature of which was 20° C. below zero (4° F. below zero) owing to the putrefaction which took place very rapidly. The natives of Greenland consider extreme cold very favorable to putrefaction, and the Esquimaux are in the habit of removing the viscera from an animal as soon as it is killed, and filling its body with pebbles to preserve it from decomposition.

It appears to us that these facts may be accounted for, partly by the condensation of the air, and its richness in oxygen at this extremely low temperature; and partly to the fact that ozone may become stable at a great degree of cold. Indeed, 100 cubic centimetres of air at 25° C. (77° F.) and containing 20 per cent. of oxygen in volume, are reduced to 84.5 cubic centimetres at 20° C. below zero (4° F. below zero.) Hence it follows that the quantity of oxygen which acts at a given moment on the

* *The Second Grinnell Expedition in search of Sir John Franklin, 1853-4-5.* By Elisha Kent Kane, M. D., U. S. N.; 2 vols. 8vo. Philadelphia, 1856.

surface of a body at 25° C. (77° F.), being represented by 84.5, that which would act on the same surface at 20° C. below zero (4° F. below zero) may be represented by 100. The action of oxygen at 25° C. (77° F.), and 20° C. below zero (4° F. below zero) would be then, as regards quantity, in the ratio of 84.5 to 100. But when this oxygen is in the state of ozone this last cypher is far too low. Now, I have shewn elsewhere (*THE CHEMIST*, December, 1856) that when oxygen acts on organic bodies at the ordinary temperature, it is in the state of ozone, and that the first phase of every spontaneous alteration of organic bodies under the influence of the air (eremacausis, fermentation, and putrefaction) consists in the transformation of the oxygen of this air into ozone. Now, heat, 75° to 200° C. (167° to 392° F.) destroys ozone, as is known, but cold, according to M. Houzeau's experiments, appears to be favorable to its existence; it seems unquestionable that at 20° C. below zero (4° F. below zero) ozone is very stable.—*London Chemist*, February, 1858.

ON THE LIQUOR POTASSÆ ARSENITIS OF THE LONDON
PHARMACOPEIA.

By HENRY K. BAMBER, Analytical Chemist.

Some of the higher authorities in pharmacy have given it as their opinion (*Phar. Journal* for May, 1857, page 543) that no chemical decomposition arises on boiling arsenious acid with carbonate of potash in making the liquor potassæ arsenitis of the Pharmacopœia. Not seeing why a reaction should not take place, I determined to make experiments in order to satisfy myself if such was the case or not. I first boiled carbonate of potash (KO , CO_2 with excess of arsenious acid, and passed the vapor through lime water contained in a Wolfe's bottle; in the lime water I obtained an abundant precipitate of carbonate of lime, clearly indicating decomposition of the carbonate of potash.

After allowing the liquid to cool, in order to let the arsenious acid, which would have been dissolved by the boiling water, deposit, I filtered and evaporated the liquid to a syrupy consistence, and placed it over sulphuric acid for some time, in order to see if it were possible to obtain crystals, or a crystalline sub-

stance; but failing in that, I evaporated it carefully to dryness, and made an analysis of the substance dried at 100° C. This yielded 73.976 per cent. of arsenious acid. The percentage of arsenious acid contained in a substance of the formula KO, AsO_3 , presuming that such is the composition of arsenite of potash, would be 67.757—my substance, therefore, contains a little more than six per cent. of arsenious acid in excess, as expressed below:—

73.976 percentage of AsO_3 in substance examined.
 67.757 percentage of AsO_3 in the $(\text{KO}, \text{AsO}_3)$.

6.219 excess of arsenious acid.

I tried to get rid of this excess of arsenious acid, by treating the substance with cold water, filtering from the undissolved arsenious acid, evaporating to dryness, again treating with cold water, and repeating this until it dissolved in water, without leaving a residue; but I found, on analysis, that it had made little difference in the percentage of the arsenious acid.

Another experiment was made by boiling carbonate of soda (NaO, CO_2) with excess of arsenious acid, treating it precisely in the same manner as the compound with potash; but I was equally unsuccessful in obtaining crystals or a crystalline substance.

This substance, dried at 100° C. was found to contain 82.382 per cent. of arsenious acid. The percentage in a compound of the formula $(\text{NaO}, \text{AsO}_3)$ would be 76.1538:

82.3820 percentage of AsO_3 in substance examined.
 76.1538 percentage of AsO_3 in $(\text{NaO}, \text{AsO}_3)$.

6.2282 excess of arsenious acid.

As exhibited above, the soda compound with arsenious acid had more than six per cent. of acid in excess, just as the compound with potash. I considered it advisable to make a complete analysis of this substance; the results were as follows:—

82.382 per cent. of arsenious acid.
 17.409 per cent. of soda.

99.791

These results were checked by a second analysis, and the following numbers were obtained :—

82.80 per cent. of arsenious acid.

17.81 per cent. of soda.

99.61.

Seeing that a perfect decomposition of the carbonate of potash and carbonate of soda might be effected by using an excess of arsenious acid, I then tried the exact proportions ordered in the London Pharmacopœia for making the liquor potassæ arsenitis, viz., equal parts of arsenious acid and carbonate of potash. I weighed very accurately five grammes of each, and boiled them with ten ounces of distilled water in a flask, until all the arsenious acid was dissolved. After boiling, there remained six ounces of liquid. I then determined the percentage of carbonic acid in it, and instead of finding .8535 per cent., which I should have found had no decomposition taken place, I only obtained .334 per cent. By calculation, I find that if the arsenious acid had decomposed its equivalent of carbonate of potash, the solution should have contained .2575 per cent. of carbonic acid, which is only about $\frac{7}{100}$ of a per cent. less than I really found.

I think this clearly shows that a decomposition of the carbonate of potash does take place, and the solution contains arsenite of potash and undecomposed carbonate of potash, the undecomposed carbonate being due principally to the fact, that more carbonate of potash is used than the arsenious acid is capable of decomposing.—*London Pharm. Journ.*, March, 1858.

ON PYRODEXTRINE.

By M. GELIS.

[The following is extracted from a report to the French Academy, by Messrs. Chevreul, Regnault and Pelouze, on a communication of M. Gelis on the action of heat on organic substances.—*ED. AMER. JOUR. PHAR.*]

This brief history was necessary for understanding what M. Gelis has added to the question.

He did not study the colorless compound, desiring to know the cause of the coloration of roasted starch, bread-crust &c. ;

he adopted the conditions most suitable for obtaining a high degree of torrefaction, that is to say, the greatest coloration possible. He acted quite contrary to the manufacturer of dextrine, who moderates the action of heat as much as possible, lest his products should acquire a yellowish tint which would render their sale less easy.

He begins the torrefaction in a flat-bottomed basin, heated at one end; the fecula is placed at one end; it first loses all its hygrometric water, is converted into dextrine, and begins to become colored. Then, the heat continuing its action, this dextrine undergoes a kind of igneous fusion; it swells up, and it then becomes easy to separate this half-fused matter from the bottom of the basin, by means of an iron spatula, under the form of strips, which are broken on cooling. These strips are pushed into the cooler parts of the basin, and the hot parts are covered with fecula, the torrefaction of which is not so far advanced.

By continuing this plan for a sufficient length of time, we ultimately convert all the fecula into fused matter. This matter is already very highly colored.

In order to reach the fecula and dextrine, which, imprisoned in the fused mass, have escaped torrefaction, the product is heated with water, the burnt and insoluble portions are separated by decantation, and the liquor is evaporated to the consistence of an extract. This extract is divided into small masses, which are placed in the drawer of an aerothermal furnace, the dessication is first completed, and then the torrefaction is finished by keeping the matter for a sufficient length of time at 230°C . (446°F .)

His final product occurs under the appearance of light spongy masses, like tannin, unalterable in the air, easily reduced to powder by simple pressure between the fingers, extremely soluble in water, without being deliquescent, and furnishing with water a deep brown solution. This matter, when the operation has been well conducted, is almost entirely formed of a new colored substance which M. Gélis has called *pyrodextrine*.

This substance is more stable than the different products which are extracted from caramel: thus, it is not necessary for obtaining it in the pure state to avoid the employment of acids and bases which destroy the derivatives of sugar with such facility.

When it is mixed with only very small quantities of dextrine, it may be obtained pure by precipitating it with alcohol from its concentrated aqueous solution.

When it contains a more considerable quantity of foreign matters, it is precipitated from its aqueous solution by baryta water. The dextrine is not precipitated by this reagent, whilst pyrodextrine is deposited in the state of basic salt. It is sufficient, for the precipitation to be complete, to add to the liquors about 10 per cent. of alcohol.

When pyrodextrine forms only a very small proportion of the substances from which it has to be extracted, in the burnt crust of bread, for instance, we may, by means of malt or sulphuric acid, convert into sugar the starch, soluble starch and dextrine which this matter contains in abundance, destroy the sugar formed by fermentation, and extract the pyrodextrine, by means of baryta, from the residue of all these operations.

Whatever substance may have furnished the compound of baryta and pyrodextrine, the latter may always be extracted from it in the pure state.

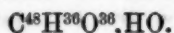
To arrive at this result, the well-washed precipitate is treated with sulphuric acid in proper quantity, and the excess of acid is saturated with carbonate of baryta; we filter, concentrate the liquor, and precipitate with alcohol. Pyrodextrine is deposited at the bottom of the flask, under the appearance of a black and thick syrup; this syrup is redissolved in water and evaporated to dryness.

The pyrodextrine obtained by this process is a solid, black and brittle substance; brilliant and elastic, like gum, when it has not been completely dried. It is insipid and odorless, unalterable in the air, insoluble in concentrated alcohol, almost soluble in weak alcohol, and insoluble in ether.

Water, on the contrary, dissolves it with facility; the solution is gummy and adhesive; it has a peculiar brown color. This color is quite distinct from that of the different caramels; it is duller. This coloring powder of pyrodextrine is about three times as great as that of caramelane, but it is inferior to that of caramelene.

Pyrodextrine resists the action of heat much better than sugar. It does not color purple red the aqueous solution of iodine, as dextrine does.

Heat causes dextrine to lose water and converts it into pyrodextrine. At the same time, the saturating power is diminished. The equivalent of dextrine contains 12 equivalents of carbon: that of pyrodextrine contains 48. Its formula is:—



Pyrodextrine appears to be the only soluble colored substance which can be produced by the action of heat on dextrine,

When we heat the former a little above 230°C . (446°F .) the temperature at which it begins to be altered, it is converted directly into insoluble black products.

Pyrodextrine is found in abundance in bread crust and pastry, in roasted coffee, in brewers' malt, and in all matters rich in fecula which have been submitted to the action of a rather strong heat.

Such is the substance of the two memoirs which M. Gélis has presented to the Academy. They enrich science with several new products. They show that the different neutral organic substances may give various compounds when they are submitted to the action of regulated heat.

The author has given proof of much skill and perseverance in these difficult researches. We have the honor to recommend the insertion of these two memoirs in the *Recueil des Savants Etrangers*.

This recommendation was adopted by the Academy.—*London Chemist, March, 1858, from Comptes Rendus, Dec. 14, 1857*

ON THE EFFICACY OF ROMAN CHAMOMILE IN SERIOUS SUPPURATIONS.

By M. OZANAM.

The Roman chamomile (*anthemis nobilis*), long disdained by therapeutists, is only mentioned in their treatises on materia medica as fit for soothing stomach-aches, gastric derangements, and for improving the appetite. Leméry calls its flowers emollient, digestive, carminative, resolute, alleviating and strengthening. All these properties are very vague, and no one to my knowledge has discovered the great and precious virtue of chamomile—that of preventing suppurations, when the evil has not

advanced too far, and of drying them up when they have existed for a long time.

For this purpose the medicament is administered in large doses; an infusion of 5, 10, or even 30 grammes of flowers to one quart of water, to be drunk during the day, until the cure is complete. Moreover, the remedy may be applied locally by means of compresses soaked in it. This sustains the medical action, but does not cause the principal effect, since that can be perfectly developed either with or without local application. Thus this property of camomile must be regarded as arising from a general action on the economy, and not as the result of a local action.

First Case.—(May and June, 1849).—A man, aged 38. Phlegmonous erysipelas of the face and scalp. Five enormous abscesses denuding all the bones of the cranium, which were covered with a cap of pus; a sixth abscess was formed at the angle of the lower jaw; continuous delirium, and violent fever, (pulse 140), complete prostration of strength: employment of camomile the twenty-eighth day (30 grammes per day), suppuration increased for the first few days; I decreased the dose to 15 grammes, rapid diminution of suppuration at the end of twenty days' treatment, the patient left completely cured.

Second Case.—(July to November, 1849).—A man, aged 35. Phlegmonous erysipelas of the foot, leg, and thigh. Fourteen successive abscesses, very soon communicating together, for the length of more than 60 centimetres (about 24 inches); denudation of the bones of the foot, of the tibia, and of the femur; enormous suppuration; and at the end of three months, the patient was in a completely cachectic state; amputation of the thigh was proposed as a last resource, but the patient refused. I then commenced the employment of the camomile (30 grammes per day); return of strength, progressive diminution of suppuration, the flesh was sustained by systematic compression; cure at the end of six weeks without any other treatment.

Third Case.—(May, 1855).—A man, aged 26. Obstinate

intermittent fever, of the Campagna of Rome, of nine month's standing:—Crisis by an abscess on the right flank, as large as the head of a child of two years old. I opened it with a bistoury; very abundant suppuration; camomile in large doses (30 grammes per day; after eight days, two violent fits of intermittent fever, which had disappeared to give place to a continuous fever from the time of the appearance of the abscess. The treatment was interrupted for a few days, and then resumed in the dose of 15 grammes per day; cured at the end of three weeks.

Fourth Case.—(December, 1855, January and February, 1856).—A man of 22. Malignant typhoid fever; left pleurisy the twenty-first day; hæmoptysis and right pulmonary apoplexy the twenty-fifth day; suppurated right pneumonia the thirty-second day; expectoration of pus to the amount of 150 grammes per day; hectic fever with profuse perspirations: employment of camomile, in moderate dose, owing to the weakness of the patient, (15 grammes per day); and local applications to the chest; return of strength; progressive diminution of suppuration; cure at the end of twenty-five days.

This valuable faculty of drying up suppurations deserves to be tried on a large scale, for we have in medicine very few remedies efficacious in such cases. Chamomile, in large doses, will be indicated in the purulent diathesis of amputations, in puerperal fever, in phlegmonous erysipelas, in fact in every case in which it is desired to prevent too abundant or too long continued suppurations. Sometimes, as in the first case, the cure is preceded by a transient aggravation of the evil; this recrudescence, which is a medicinal effect, should not discourage, but shows only that the doses should be diminished so as to arrive at a more general cure.—*Chemist*, March, 1858, from *Comptes Rendus*.

ON THE ORDINARY METHODS FOR DISCRIMINATING THE
CINCHONA ALKALOIDS.

BY W. BIRD HERAPATH, M. D. LOND., F. R. S. E.

In consequence of the gradually increasing scarcity of the *cortex cinchonæ calysayæ*, and its chief product, quinine, many other barks have been introduced into commerce, which furnish alkaloids, having a strong general resemblance in the physical characters of those preparations of them more commonly employed in medicine, but differing widely in medicinal properties and commercial values.

In order to prevent fraudulent adulterations, it has long been highly desirable to have some ready methods of detecting admixtures of these alkaloids and their salts. The author having discovered several optical salts of these vegetable alkaloids, proposes to make their well-marked optical characters the means of such detection, and in a subsequent paper has fully developed his views upon this ready method of analysis; whilst in the present he has passed under review the various existing tests for the different cinchona alkaloids, and the results of his investigations may be enumerated under the following conclusions:—

The following different methods for detecting the various cinchona alkaloids have been proposed:—

To Bouchardat and Pasteur we are indebted for the use of polarized light as a means of discriminating these alkaloids by the rotary power which they exercise upon its plane.

Liebig employs the difference of their solubility in ether for the same purpose.

Almost all the other tests proposed have for their object only the discovery of quinine.

Professor Stokes employs fluorescence, combined with the peculiar reaction, in respect to this phenomenon, of hydrochloric acid, alkaline chlorides, &c. Brandes, the green reaction produced by the successive addition of chlorine and ammonia, whilst Vogel has modified the latter test in several ways.

Pelletier has employed the agency of a stream of chlorine gas, and Marchand uses nascent oxygen, obtained from puce-colored oxide of lead and sulphuric acid for the discovery of quinine.

Leers first proposed a combination of Liebig's ether test, with

that of Brandes's chlorine and ammonia reaction, as a means of establishing the purity of cinchonidin (miscalled by him quinidin, in common with all German chemists).

De Vry has advised the employment of hydriodic acid or iodide of potassium, in order to discover the quinidin of Pasteur.

Van Heijningen depends on oxalate of ammonia to discriminate quinine from quinidin.

All these different tests the author has examined most critically, and, as far as it is possible to do so, determined the absolute numerical value of each method experimentally with the following results:—

He first explains MM. Bouchardat and Pasteur's researches on these remarkable alkaloids, from which it appeared that quinine and cinchonidin are powerfully lævogyrate, quinidin and cinchonine pre-eminently dextrogyrate, and that quinicine and cinchonicine are only slightly dextrogyrate upon plane-polarized light. These eminent experimenters determined also with accuracy the amount of these molecular rotations for each alkaloid. Yet the expensive nature of the apparatus, the complex formula requisite to reduce the observed amount of angular rotation to the normal molecular standard, and the many interfering actions necessary to be guarded against, effectually prevented this from ever becoming a process for general adoption, either among chemists or manufacturers.

Another method of recognizing the presence of quinine is founded on the optical phenomena of fluorescence, which have been investigated by Professor Stokes. Whilst endeavoring to turn this process to account in the quantitative estimation of quinine by means of excessive dilution, and marking the points at which the various phenomena of "epipolism," "fluorescence," and "internal dispersion" vanish, the author arrived at the following extraordinary results; premising that he employs the term "internal dispersion" to mean the positive, "fluorescence" the comparative, and "epipolism" the superlative degrees of the same optical power:—

I. Solutions containing 1 grain in 35,000 of either quinine or quinidin of Pasteur, exhibit epipolism and fluorescence; solutions with 1 grain in somewhat less than 140,000 grains of water are still fluorescent, with slight internal dispersion.

When diluted with from three to ten gallons of water, these alkaloids continue to exhibit internal dispersion.

Solutions of quinicine are only slightly epipolic, and if the change has been perfect, scarcely at all fluorescent, but nevertheless strongly absorptive of rays of high refrangibility.

Cinchonidin also exhibits optical phenomena, but in a much slighter degree, about $\frac{1}{100}$ th part of that of either quinine or quinidin.

Cinchonine is also fluorescent about $\frac{7}{120}$ th part of the same alkaloids.

II. That on mixing fluorescent solutions of quinine, quinidin, or other cinchona alkaloid with the soluble chlorides, although all traces of optical phenomena are lost to the eye, yet the media still possesses powerfully absorbent powers on the rays of high refrangibility, and, if sufficiently concentrated, are wholly opaque to them, without exhibiting any of the phenomena of dispersion, and greatly impede chemical action.

This was proved by three methods of observation:—

1st. By introducing vessels containing fluorescent solutions of quinine into other vessels filled with non-fluorescent solutions of the alkaloids, produced by previous admixture with chloride of ammonium, when all optical phenomena disappeared from the inner vessel.

2ndly. By surrounding fluorescent specimens of fluor-spar with these prepared solutions of the alkaloids, when the blue color in the spar immediately disappeared.

3rdly. By photography; employing concentrated solutions of quinine mixed with chloride of ammonium in troughs to intercept the incident light from any object anterior to the camera, when it was found almost impossible to obtain any image upon the sensitive collodion plate, although the intensity of the visible image received on the ground-glass screen did not suffer any apparent diminution.

4thly. By photographic printing; troughs containing these solutions obstructed the chemical rays very considerably, thus interfering with the production of a positive picture from the negative, much longer exposure being necessary to produce any chemical effect.

III. That certain reagents do not destroy fluorescence; others

only mask its appearance by their own color, whilst some destroy it by neutralizing the excess of acid; others do so by producing salts which are themselves non-fluorescent media. Whilst a third class destroy it by really modifying the alkaloid itself.

IV. That as so many reagents of common occurrence interfere with the manifestation of fluorescence, and as it is also a property common to all the cinchona alkaloids herein described, its appearance becomes no longer of any value as a test for quinine.

V. Brandes's chlorine and ammonia test will discover 1 grain of either quinine or quinidin in 1 gallon of water, but shows no difference between these alkaloids, except in very concentrated solutions, when there is a precipitate with quinidin, but not with quinine.

Quinicine is also influenced by this test, but less extensively.

VI. Dr. Vogel's first modification of this test is of no apparent value; but by also employing ammonia, the author has found that it will indicate both quinine and quinidin, detecting readily 1 grain of either in a pint, and showing slight evidence with 1 grain in 10,000 grains of water.

There is scarcely any reaction with quinicine.

VII. Dr. Vogel's other modifications of Brandes's test are unimportant, with the exception of the fourth, viz., excess of chlorine, and very little ammonia. This detects 1 grain in about 2000 grains of fluid very readily, if excess of acid be avoided at first. The test, however, is equally indicative of quinidin; it gives scarcely any perceptible reaction with quinicine.

VIII. Pelletier's chlorine gas-test succeeds very well with the free alkaloids, but does not show any indication with their salts. It is equally capable of detecting quinidin, and gives the same phenomena.

IX. Marchand's test is not a delicate reaction.

X. All the foregoing tests, although specially proposed for the discovery of quinine, possess equal powers, and show the same appearances with quinidin. But they have no reaction on cinchonine, cinchonidin, or cinchonicine.

XI. Van Heijningen's test by oxalate of ammonia, produces, after some hours, a crystalline oxalate of quinine, when using a

fluid containing only 1 grain of alkaloid in 800 grains of water, and very readily detects immediately 1 part in 350. It does not precipitate quinidin or cinchonidin, but it produces a white precipitate in concentrated solutions of cinchonine.

XII. De Vry's test for quinidin by hydriodic acid, or iodide of potassium in neutral solutions, produces a well-marked crystalline precipitate as a colorless salt, when 1 part of the alkaloid is present in 1000 of the fluid; the crystals, being short hemihedral prisms, are readily recognized; the neutral hydriodates of cinchonidin are colorless, silky, prismatic needles, and much more soluble. If to a solution of the sulphate of quinidin in dilute spirit ($\frac{1}{2}$) we add hydriodic acid and expose to the action of light during some days, there is formed the red iodo-sulphate of the author.

The neutral hydriodate of quinine appears as lemon-yellow prisms. The neutral hydriodate of cinchonine appears as long, thick, colorless prisms, and is very soluble.

XIII. Leibig's ether test dissolves quinine, quinicine, and cinchonicine, and therefore does not discriminate between them, as they are all uncrystallizable. It dissolves also a portion of the quinidin and cinchonidin. Should the proportions of these alkaloids not exceed the solvent powers of the ether employed, they will not be indicated by this test. When crystallization occurs, the rhombic prisms indicate cinchonidin; the long slender aciculae, quinidin; whilst an amorphous powder is demonstrative of cinchonine. Ether also extracts cinchonidin from cinchonine; but its sparing solubility in ether necessitates the employment of warmth, and a large quantity of ether.

XIV. Leer's combination of the ether test with that of Brandes can readily detect small portions of quinine, quinidin, or quinicine in cinchonine or cinchonidin, especially when used in the manner as modified by the author.—*Proceedings of the Royal Society, from London Pharm. Journal, March 1858.*

ON THE OPTICAL AND CHEMICAL CHARACTERS OF THE IODO-SULPHATES OF THE CINCHONA ALKALOIDS, TOGETHER WITH THE CHEMICAL ANALYSIS OF SOME OF THE SALTS.

By W. BIRD HERAPATH, M. D., Lond., F. R. S. E.

In the former paper, the author examined the existing tests for discriminating between the various cinchona alkaloids, and pointed out their insufficiency. In the present paper he shows that the optical characteristics of the iodo-sulphates of the alkaloids quinine and quinidin are sufficiently well marked to render the existence of *either one* of these *certain*, and that although the iodo-sulphate of cinchonidin is very closely related optically and chemically to the homologous salt of quinine, yet there are sufficient points of dissimilarity to enable us to diagnose between the two; and, moreover, that the production of this salt is a beautiful means of deciding readily whether cinchonidin is present in specimens of cinchonine or cinchonidine; all evidence of quinine or its allies having been decided in the negative by the results of the previous tests, as proposed by Brandes, Vogel, Pelletier, Leers, or the author.

The cinchonidin of Wittstein has also, by the same method, been proved by the author to be totally different from the cinchonidin of Pasteur.

Acetic acid and chloroform may also be employed for discriminating between cinchonine and cinchonidin.

The *chemical characters* of all these iodo-salts furnish no means of discrimination, for as a class they all agree in being more or less soluble in spirit, giving a deep sherry-brown solution, from which water precipitates them in an amorphous form, as dark brown, cinnamon-brown, or purplish-brown colored precipitates; they are only very slightly soluble in dilute spirit, and scarcely at all in water, ether, turpentine, or chloroform: acetic, dilute sulphuric, or hydrochloric acid have but little action upon them, whilst concentrated hydrochloric or sulphuric acid decomposes them. Nitric acid rapidly acts upon them, even in the cold, with violent evolution of nitrous acid and production of heat, iodine being oftentimes liberated in the crystalline form.

Alkalies also decompose them.

Sulphuretted hydrogen, soluble sulphides, sulphurous acid and sulphites, together with chlorine water, instantly decolor their alcoholic solution, with the production of hydriodic acid.

In dilute alcoholic solutions, starch gives immediate evidence of iodine, and nitrate of silver gives a yellowish-white precipitate of iodide of silver, and some organic basic compound which can only be removed by the action of concentrated boiling nitric acid; this reaction, although commencing at the ordinary temperature, with violent disengagement of nitrous acid vapors, must be perfected by boiling.

Baryta salts exhibit the existence of sulphuric acid, which in all instances is an essential constituent in their formation.

The quinidin and cinchonin salts dissolve with more difficulty, in consequence of their greater thickness and less extent of surface.

Since the author had the honor of communicating his discovery of the optical salt of cinchonidin to the Royal Society, he has ascertained that its primary form is, like that of the quinine salt, that of a right rhombic prism, and usually very thin.

Both the quinine and cinchonidin salts are derivable from the primary rhombic prisms, and crystallize as rhomboids and β -prisms

and α -prisms

In the quinine salt

In the cinchonidin salt

{ which obstruct plane-polarized light, when their longer diameters are parallel to the plane of the polarized ray.

{ which obstruct the same beam when their longer diameters are perpendicular to the plane of the polarized ray.

{ the rhomb obtuse = 115°

{ " " acute = 65°

{ the rhomb obtuse = 137°

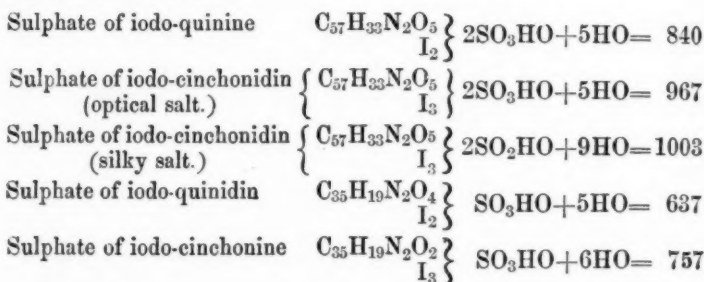
{ " " acute = 43°

A remarkable difference exists between the quinine and cinchonidin salt, which is, that the optical crystals of the last salt, if allowed to remain in the mother-solution with an excess of less than 1 per cent. of sulphuric acid, undergo a transformation, and become long, golden, silky aciculæ, radiating in beautiful globose tufts: this salt has some doubly absorbent powers also, but very feeble. When this salt is attempted to be redissolved in boiling spirit, in order to be recrystallized, it does not re-form, but the optical crystals are then produced; when the silky crystals are carefully air-dried, they retain their yellow

color, but if exposed over sulphuric acid at 62° Fahr., or if attempted to be dried at 212° Fahr., they lose 5.32 per cent. water = 6 atoms, and become a dark greenish-black residue, which is a tri-hydrate.

If this olive-colored residue be boiled in dilute spirit, the optical crystals deposit on cooling.

The author's more recent analyses of the iodo-sulphates of the cinchona alkaloids have induced him to suggest the following formulæ for them :—



From this it appears that the optical salt of quinine differs in chemical atomic numbers merely in the possession of 1 atom less iodine, the cinchonidin salt having 3, the quinine salt 2 atoms iodine ; but in each case 2 atoms of sulphuric acid, and 5 water, with an organic base of $C_{57}H_{33}N_2O_5$ common to both. How this is derived from $C_{40}H_{24}N_2O_4$ in the one case, or $C_{40}H_{24}N_2O_2$ in the other, it is difficult to point out in the present state of the question.

Closely as the quinine and cinchonidin salts agree amongst themselves, they differ widely from the quinidin and cinchonine compounds.

The quinidin salt, after recrystallization, presents itself as long quadrilateral acicular prisms, having a deep ruby or garnet-red color, with a bluish-violet or light purplish reflexion-tint ; it is sometimes deposited in thin flat plates, or long, flat, acicular prisms ; these, when thin, transmit a pure yellow color, but in thicker plates it becomes reddish, with a tinge of brown.

There is scarcely any appearance of double absorption in this salt ; the thicker crystals alone exhibit it, when their usual tint becomes darkened on analysis with a Nichol.

This salt requires 31 parts of boiling spirit, and 121 part

at 62° to dissolve 1; water precipitates it as a cinnamon-brown powder.

Its deep marone-colored large aciculæ had a specific gravity of 1.7647 at 62°.

These large crystals, exposed whole to a temperature of 212°, decrepitate afterward on exposure to the air; but dried at 212°, they do not appear to lose further water after prolonged exposure to the drying-bath.

The cinchonine salt exists in long, acicular, quadrilateral prisms, of a deep purplish-black color, like that of elderberries.

Thin crystals transmit a yellow tint—pure gamboge-yellow when very thin; soon passing through a deep sherry-brown to a blood-red color, then a deep port-wine color, and then becoming opaque.

These crystals reflect a deep steel-blue color when analyzed with a Nichol's prism, and generally across the short diameter of the prism, which is the analogue of the α -prism of the quinine salt. The cinchonine salt possesses doubly absorbent powers, much more powerfully so than the quinidin salt, but inferior to all the others, the body color is deep sienna or bistre-brown.

These investigations appear to show that the alkaloids in each instance undergo some modification, but not analogous to substitution; it appears more like a splitting-up into different molecular groups, and a re-arrangement of these amongst themselves, as the formulæ of the organic bases differ much from those of the original alkaloids.

All these iodo-salts possess double refractive properties.

When the acid sulphates of the mixed alkaloids, quinine, quinidin, cinchonine, and cinchonidin, are dissolved in dilute spirit, and the temperature increased to 80° or 120°, treatment with tincture of iodine readily separates the quinine salt first.

Subsequent further treatment in the same manner produces the cinchonidin salt, more or less mixed with the quinine salt.

On still further treatment, the quinidin salt is formed with its well-marked characters.

The cinchonine salt is by far the most soluble in spirit; and

when a large quantity of cinchonine exists, this compound will also appear along with the quinidin salt.

This test is a beautiful and ready method of proving the presence of cinchonidin in cinchonine, which would otherwise be considered pure, Brandes' test having shown the absence of quinine and quinidin. In the same way, this test is an easy method of detecting mixtures of quinine and quinidin, the optical characters of the two salts being so well marked, that no difficulties can exist in their discrimination.

It does not offer such facilities for the separation of quinine from cinchonidin; the two salts go down together, especially if large quantities of cinchonidin exist with mere traces of quinine.

For the success of this test, a small portion only is necessary; with quinine and quinidin $\frac{1}{200}$ th part of a grain has furnished evidence of the two alkaloids; one grain would be abundant to detect all the alkaloids.

The foregoing method of examination has enabled the author to prove that the substance which Rosengarten, of Philadelphia, called quinidin, was really the cinchonidin of Pasteur, and the details of his cures for fever, therefore, by quinidin, are rather to be ascribed to cinchonidin.

The cinchonidin of Wittstein, of Munich, is a totally different alkaloid, giving, with sulphuric acid and iodine, a salt at once to be distinguished by the eye from either of the two iodo-sulphates described, but yet possessing optically doubly absorbent powers. This salt has a deep orange-yellow color by transmitted light, merging into sienna-brown in thicker plates, which are generally flat and much imbricated in the method of crystallization, and also derived from a rhombic prism. The reflected tints are brownish-olive, not unlike dead leaves, or brown beech-leaves. These crystals are more doubly absorbent than either the quinidin or cinchonine salt, but less powerfully optical as tourmalines than the quinine or cinchonidin compounds. When polarized, they transmit a sienna-brown body-color if moderately thick, and thicker plates are bistre-brown, but when sufficiently thick, they are wholly impervious to plane-polarized light. The substance was not in sufficient quantity to admit of any analysis.

All the alkaloids were furnished in a most obliging manner by Mr. John Elliott Howard, to whom the author is deeply indebted for them, and thus publicly desires to express his acknowledgements; many of these various alkaloids having taken more than ordinary trouble in the preparation and purification.

It is well known that quinine and quinidin, under the continued effect of heat and dilute sulphuric acid, undergo a molecular change into quinicine, which M. Pasteur has asserted to be isomeric with the original alkaloids, but hitherto no complete analysis has been made of the metamorphosed alkaloids.

The author has produced an iodo-sulphate of quinicine, but it is no longer a crystalline compound; it presents itself as a deep blood-colored resin, very soluble in spirit and readily precipitated by water from its spirituous solution. This substance has not yet been submitted to analysis. During the production of the iodo-sulphate of quinidin a certain portion of the alkaloid becomes converted into quinicine, as may be demonstrated by the production of this resinous compound from the mother-liquid on the addition of further proportion of iodine.

Cinchonine and cinchonidin become converted into cinchonine by similar treatment, and this amorphous uncrystalline alkaloid also forms a resinous iodo-sulphate; its color is deep purple-black, and it deposits itself on spontaneous evaporation of the spirit, or on the cooling of a highly concentrated spirituous solution, in small drops, highly tenacious at 100° Fahr., but becoming solid at 60° Fahr. This compound has, in a fine state of division, a beautiful purplish-blue color, and such a film generally forms around the edge of the vessel in which it is produced.

Cinchonicine appears to be one of the products during the manufacture of the iodo-sulphate cinchonidin, but there is a much larger production of it during the formation of the cinchonine salt.—*Proceedings of the Royal Society, from the London Pharmaceutical Journal, March, 1858.*

GLYCERINE A PROPOSED SUBSTITUTE FOR OILS AND
FATS IN OINTMENTS.

By G. F. SCHACHT.

The exhibition of cerates and ointments to diseased and tender surfaces, however necessary and beneficial at times, is always attended with certain inconveniences, resulting from some of their essential properties.

Among these may be mentioned the insolubility in water of the fatty matter which constitutes the mass of their substance, inasmuch as when the application has to be removed, the operation can only be accomplished either by considerable mechanical force or by the employment of soap, both of which methods it would generally be highly desirable, if possible, to avoid.

A second inconvenience presents itself in the fact that most of the remedies applied in this form are insoluble in fat. The excipient, therefore, in such cases, instead of facilitating the cure, acts to a certain extent in defending the part from the perfect action of the remedy.

But perhaps the strongest objection against the employment of fatty substances in skin diseases exists in the liability they possess of becoming rancid by oxidation—a property I believe to be inherent and unavoidable.

These considerations constitute, I think, sufficient justification for urging the trial of some more satisfactory excipient; and I hope, in the intrinsic claims to interest which the subject presents, sufficient excuse will appear for a notice which I confess to be far from complete.

A few months ago I was requested by Dr. William Budd, of this city, to contrive a formula of glycerine and starch (already, as he understood, employed in France), that should be applicable as a basis for this class of preparations. I have that gentleman's permission to say that the result of my experiments is highly satisfactory. The article produced presents the following fortunate aggregate of properties:—Its consistence is good, and does not vary with changes of temperature; it is soluble in water, and may consequently be removed from tender surfaces with the greatest ease; it dissolves and thoroughly mingles with all material that are soluble in water, and therefore presents such remedies

in the condition most favorable for absorption: and, lastly, it is not liable to rancidity; that is, as far as I have yet been able to ascertain, the date of my first preparation being July 30th, and it having as yet presented no evidence of this kind of change.

The proportions I employ with such favorable results, are:

Glycerine, 1 f. oz.
Starch powder 70 gra.

and the entire process consists in mixing the ingredients cold, and heating the mixture gradually to about 240° Fahrenheit, constantly stirring.

This constitutes a basis, with which may be produced preparations corresponding to most of the cerates and ointments of the Pharmacopœia, but free from the special peculiarities to which I have before alluded.

As the compound word amylo-glycerine, though perhaps the most appropriate, would from its length be somewhat inconvenient, I have adopted the term "*Plasma*,"* and by this name

FROM A CORRESPONDENT.

* The word *Plasma* is derived from the Greek πλασσω, *I form*, and in its ordinary significance, means *something formed or moulded*.

It was however employed, occasionally at least, in a very different sense, and in one which renders its proposed application to an ointment not quite unobjectionable. We allude to *Plasma* as signifying a *wash for the throat or a gargle*, as in the following lines of Persius:—

Scilicet hæc populo, pexusque togaque recenti,
Et natalitia tandem cum sardonyche albus,
Sede leges celsa, liquido cum *plasmate* guttur
Mobile collueris, patranti fractus ocello.

Sat. I., v., 15—18.

Thus rendered by Drummond:—

See at the desk the pale declaimer stand;
The ruby beaming on his lilly hand;
Behind his back his wanton tresses flow;
With Tyrian dyes his splendid garments glow;
His pliant throat the liquid *gargle* clears;
His languid eye lasciviously leers.

Facciolati, after noticing the other and more usual significations of *Plasma*, says:—

"Est etiam potio ex dulcioribus quibusdam rebus composita qua coluebant os et fauces ad fingendam vocem, ut liquida esset, claraet, sanvis: *gargarisma per la voce*."—Pers. Sat. I., v., 17. (*Totius Latinitatis Lexicon*, t. iii.) See also Ainsworth, *Thesaurus Linguae Latinæ*, Ed. 1752, in verbum.

the few medical friends to whom I have shown the article are prescribing it. The simple word "Plasma" I apply to the excipient itself, and to it may be added the particular title of any special preparation—as for instance, "Plasma Hydrargyri," the analogue of "Unguentum Hydrargyri" of the Pharmacopœia; "Plasma Potassii Iodidi," &c. &c.

Many of these preparations are made precisely according to the instructions given for their analogous ointments. Thus, by simple mixture of the ingredients, substituting the "Plasma" for the fats in the Pharmacopœia forms, are prepared—

Plasma Antimonii Potassio Tartratis.

- " Belladonnæ.
- " Conii.
- " Gallæ Co.
- " Hydrargyri Ammonio Chloridi.
- " Hydrargyri Iodidi.
- " Hydrargyri Nitrico Oxidi.
- " Opii.
- " Plumbi Iodidi.
- " Sulphuris.
- " Zinci.

But some are best made by slightly varying processes. Thus, "Plasma Cantharidis" I prepare by evaporating the decoction of the Spanish flies to an extract, and then mixing with the Plasma.

For "Plasma Hydrargyri" I direct as follows:—

Take Mercury,	℥xij.
Glycerine,	f℥xij.
Starch,	℥xiv.

Mix the starch with six fluid drachms of the glycerine, and gradually adding the mercury, stir till globules disappear. Then add the rest of the glycerine, and heat to 240° Fahrenheit, constantly stirring.

The "killing" of the mercury by this method is by no means a formidable task.

For "Plasma Hydrargyri Nitratis" I employ the following formula, which is by calculation the same as for the corresponding ointment, excepting the free acid which the fresh ointment always contains:—

Take Terbasic Nitrate of Mercury. 3j.

Plasma, 3j. ℥

A very elegant and useful preparation with Iodide of Potassium is made by dissolving the iodide in the glycerine, mixing in the starch, and heating to 240° as above—the proportions being Pharmacopœial :—

Take Iodide of Pottassium,	3ij.
Glycerine,	f. 3ij.
Starch,	140 grs.

Mix as above.

The analogue of the Unguentum Iodini Compositum I forbear to introduce, as, however valuable the iodide of starch may be, the preparation would cease to be an application of free Iodine.

But though not quite Pharmacopœial, I venture to add one other formula, which several medical gentlemen in my neighborhood are now employing with considerable satisfaction in certain affections of the skin :—

“ *Plasma Petrolei.* ”

Take Petroleum,	3j.
Glycerine,	f. 3j.
Starch,	70 grs.

Rub the starch with the petroleum till quite smooth, add gradually the glycerine, and heat to 240° as above.

I need scarcely add, that for the production of a good result, good materials must be employed. Bottles sent out from wholesale and manufacturing houses, labelled “ *Pure Glycerine,* ” and charged accordingly, do not always contain what their labels declare. Indeed, my experience during the last few months, leads me to think that really pure glycerine is not to be met with in commerce. Some samples called pure are rich in lead, others contain chlorine, most are diluted with water, and the best I have been able to procure is acid.*

I have found it necessary, therefore, to purify even the best samples (Price’s), by digesting them for several days with powdered chalk, allowing the latter to subside, and decanting.

*To detect this acidity, it is necessary to dilute the glycerine with an equal bulk of water. Its action on litmus paper is then sufficiently decisive.

With glycerine thus obtained, and a little care, beautiful results are obtained.

I must, however, mention one imperfection to which these preparations are liable—namely, a tendency, after three or four months' existence, to lose more or less their original fine consistence, and become softer. This is an unfortunate quality, but I think it is one for which experience will be able to suggest a remedy.

Samples of the more important of these preparations will be placed upon the table for inspection.—*Pharm. Jour.*, Feb. 1858.

[The employment of glycerine in combination with amylaceous substances as a basis for ointments was introduced ten or twelve years ago by Mr. Startin. In a paper by that gentleman, *On the Introduction and Therapeutic Uses of Glycerine* (*Journ. Soc. Arts*, March 7, 1856), the following formula is recommended:—Gum Tragacanth, $\frac{1}{2}$ oz.; Glycerine 1 oz.; Lime Water, 2 oz.; Rose Water, enough to form a soft jelly. This is an elegant material, and appears to be less deliquescent than Mr. Schacht's *Plasma*.

Another compound of the same character, introduced by Mr. Startin, consists of a thick paste or jelly formed by boiling rice flour with a little water and glycerine. This affords an excellent basis for some ointments, but we are informed Mr. Startin has discontinued the use of such applications.—*Ed. Ph. Journ.*]

ON SCAMMONY.

By DR. FRANZ KELLER.

The author first of all purified commercial scammony, by dissolving it in alcohol and adding animal charcoal to it whilst boiling. This solution was mixed with water until it became turbid, and again treated once or twice with animal charcoal until it became colorless.

The alcohol was then distilled off, the residue mixed with water, and evaporated. By this means the resin separates in a soft state, and when drawn out into threads acquires the most beautiful silky lustre. The resin was boiled several times with water, by which

it became brittle. It may be easily pounded into a perfectly white powder. The analysis gave—

C	56.69	56.67	76=456	56.78
H	8.34	8.42	67 67	8.34
O	35 280	84.88

Scammonic Acid, $C^{79}H^{64}O^{43}+4HO$.—If the resin be put into a boiling solution of baryta, it is dissolved with evolution of an aromatic odor, resembling that of oil of hops, and forms a clear fluid. From this solution muriatic acid does not precipitate the resin. The baryta is thrown down by sulphuric acid in slight excess, and carbonate of lead is then added to get rid of the excess of sulphuric acid; lastly, a small quantity of lead is thrown down by sulphuretted hydrogen. In this way a strongly acid fluid is obtained, which, when evaporated, leaves an amorphous, cracked, gum-like mass, exhibiting no traces of crystallization. This mass is allowed to stand for a long time, by which means stellate groups of a fatty body, insoluble in water, separate; these are easily removed by dissolving the residue in water.

The author has analysed the lead-salt of this acid. It was obtained by slightly supersaturating the solution of the acid with ammonia, and then adding solution of acetate of lead. The analysis gave—

C	34.55	76=456	34.77
H	5.23	64 64	4.88
O	26.86	43 344	26.29
PbO	33.36	4 446.4	34.06

If the solution of this acid, or that of the resin in solution of potash be boiled with an excess of sulphuric acid, oil drops gradually separate on the surface; these solidify in a crystalline form. They are purified by repeated washing. This substance is the author's:

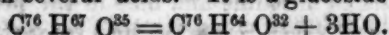
Scammonic Acid, $C^{82}H^{80}O^7$.—An acid fusible at $131-133^{\circ}$, insoluble in water, soluble in alcohol and ether. Its solutions have a strong acid reaction. From alcohol the acid crystallizes in microscopic needles. The analysis gave—

C	70.01	69.74	70.28	36=216	70.13
H	11.95	12.03	12.06	36 36	11.68
O	7 56	18.19

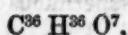
The sulphuric acid fluid which this acid separates, contains sugar in abundance. According to a quantitative determination, the resin contains 46.2 per cent. of sugar.

The volatile body which distils over when scammonic acid is boiled with sulphuric acid, is butyric acid.

From these results the author concludes, that the so-called scammony resin contains a hydrate of carbon, $C^{12}H^{10}O^{10}$ (dextrine?), conjugated with several acids. It is a glucoside of the formula

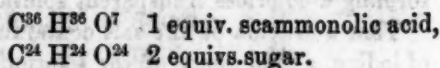


When boiled with caustic alkalies, there is produced from the glucoside an acid, scammonic acid, which, with an equal number of equivalents of carbon, is distinguished from the anhydrous resin by an addition of 4 equivs. of hydrogen and 11 of oxygen, and consequently by 4 of water and 7 of oxygen. Four of these equivs. of water are replaceable by metallic oxides. By the action of dilute mineral acids upon the glucoside acid, or the alkaline solution of the resin, the acid splits up into a new acid, scammonolic acid,



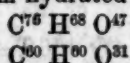
and sugar. A volatile acid is also formed, which was recognized as butyric acid.

The products of decomposition obtained, when put together, give—

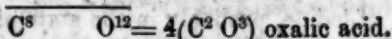
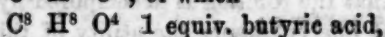


an atomic complex of . . . $C^{60}H^{60}O^{31}$

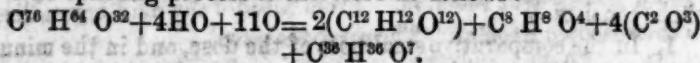
If this be deducted from hydrated scammonic acid



there remains . . . $C^{16}H^8O^{16}$, of which



The splitting process is therefore as follows:—



The presence of the oxalic acid which occurs in these equations was not ascertained by the author.—*Liebig's Annalen*, from *Chem. Gaz.*, March, 1858.

ON IODIDE OF LIME.

Dr. Pidduck made a verbal communication on a preparation of iodine which he has been using for some time with success, and which he wished to bring under more general notice.

He stated that the preparation was made, at his request, by Messrs. Morson, of Southampton Row, in 1855.

That it consisted of iodine and lime in the proportion of one part of iodine and seven parts of lime (probably in a similar state of combination to that of chlorine and lime in the so-called chloride of lime), and therefore it was named Iodide of Lime.

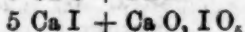
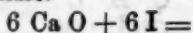
That the affinity being feeble, the salt required to be kept in a well closed bottle.

That, in solution in boiling water, the whole of the iodine is dissolved, forming a permanent solution, which is not decomposed by long keeping, nor by exposure to the air: only a deposit takes place of the superfluous lime in the form of a carbonate.

That the proportions used in the solution (of which a specimen was exhibited) were one drachm of the salt and one pint of boiling water, which, when cold, was filtered through bibulous paper, forming a colorless transparent solution.

That a drachm of the salt containing eight grains and a half of iodine, a fluid ounce of the solution contains half a grain of iodine.

That the iodine in the solution exists in the form of iodide of calcium and iodate of lime.



That the solution is decomposed by an acid, and the iodine is set at liberty: hence the utility of this form for the administration of iodine, probably in the state of an oxide.

That the superiority of this preparation to the iodide of potassium consists—

1. In the comparative smallness of the dose, and in the minute state of its atomic division.

2. In its ready combination with the blood and tissues, manifested by its alterative effects.

3. In not passing off so quickly through the kidneys.
4. In not producing gastro-enteritic and vesical irritation.
5. In being inexpensive and easily prepared, and therefore not liable to adulteration.
6. In being nearly tasteless, and therefore readily taken, even by children; and admitting of a variety of combinations in extemporaneous prescription.

Dr. Pidduck entered somewhat at length into the therapeutic effects of this form of iodine in the treatment of disease in those intractable cases of neuralgia caused by metallic poisons, such as mercury, lead and copper, for which purpose it had been extensively prescribed, in small doses of $\frac{1}{4}$ of a grain, at the Bloomsbury Dispensary during the last two years, with marked good effect. This being foreign to the objects of the Society, is omitted in this notice.—*London Pharm. Journ.—Trans. Pharm. Society.*

ON A SIMPLE METHOD OF DEODORIZING IMPURE HYDROGEN AND CARBONIC ACID GASES.

By JOHN STENHOUSE, LL. D., F. R. S.

When hydrogen gas is prepared by acting with dilute sulphuric or hydrochloric acids upon commercial zinc, it has always a slightly disagreeable odor, arising, as is well known, from the presence of a small quantity of a liquid hydrocarbon, resembling impure naphtha in its properties. The hydrogen gas made with malleable iron has a still more disagreeable odor, arising from larger quantities of a similar hydrocarbon, together with traces of sulphuretted, phosphoretted, and sometimes even of arseniuretted hydrogen. So offensive is this odor, that hydrogen gas is very seldom prepared from malleable iron, and almost never from cast iron, which yields still more of these impurities, though both malleable and cast iron are immensely cheaper sources of hydrogen than zinc. Scraps of malleable iron, from their more ready solubility in acids, are better adapted for preparing hydrogen gas than cast iron. By the following simple arrangement, however, of passing the impure hydrogen through a short column of coarsely-powdered charcoal, or, in other words,

through a charcoal air-filter, the hydrogen from either malleable or cast iron is rendered perfectly odorless, the whole of the impurities present being absorbed and retained by the charcoal. To effect this, I take a tube, either of glass or tin-plate, about an inch and a quarter in diameter and from eight to ten inches in length; this I fill with bits of wood charcoal about the size of peas or beans: the charcoal is packed loosely into the tube, so as to present no perceptible obstruction to the passage of the gas: the charcoal is placed between the wash-bottle and the eduction tube. The charcoal column just described is large enough for laboratory use; but when hydrogen is manufactured on the great scale, a larger amount of charcoal becomes necessary. In this way I have obtained, as already stated, a pure and perfectly odorless hydrogen from both malleable and cast iron; and the charcoal has remained as effective as at first, though in daily use for several weeks. The efficiency of the charcoal can always be restored by simply heating it to redness in close vessels.

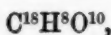
Carbonic acid, as is well known, is usually prepared for the manufacture of aerated waters, by acting upon chalk or powdered limestone by means of dilute sulphuric acid. The gas obtained in this way has invariably an offensive odor, which communicates a disagreeable taste to the aerated waters. So much is this the case, that many manufacturers obtain the gas, for the superior kinds of soda water, by decomposing bicarbonate of soda by sulphuric acid. This expensive process, however, is altogether unnecessary, for, by passing the impure carbonic acid through such a column of charcoal as that described above, I have obtained a perfectly inodorous carbonic acid, both from chalk and impure limestones, containing much bituminous matter.

RESEARCHES UPON COCHINEAL.

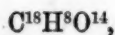
By M. SCHUTZENBERGER.

Manufacturers of printed cottons have long known that cochineal when left for several days in contact with an aqueous solution of ammonia, undergoes an interesting modification which has not yet attracted the attention of chemists. The red coloring matter (carminic acid) passes to the state of a matter of a

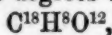
fine violet color, which acids do not modify, or cause to become red. This body cannot, therefore, be regarded as carminate of ammonia. To ascertain the transformation that takes place, I analysed some carminic acid, upon the purification of which I had bestowed the greatest care, and modified this acid by means of ammonia. By the comparison of the two results obtained, I found that the coloring matter of the ammoniacal cochineal was the amide of carminic acid. On analysing carminic acids prepared by different processes, I found that each had a different composition, but all my analyses might be definitively represented by the same formula with more or less oxygen, and I concluded therefrom that there exists at least two degrees of oxidation of carminic acid. I have in fact succeeded, by employing ether mixed with more or less alcohol as a solvent, in separating and obtaining in a crystalline form two products, of which one is represented by the formula



and the other by



as well as two intermediate degrees of oxidation, one



the other



which may be regarded either as peculiar bodies, or as compounds of the more oxidized with the less oxidized acid. By heating a mixture of carminate of soda and iodide of ethyle to 257°F . in a closed tube, I have obtained the ethers of these carminic acids in the form of red bodies, insoluble in water, but soluble in alcohol.

I have also remarked that nascent hydrogen completely decolorizes a solution of carminic acid, and that the color returns in the air. This reaction may be compared with that which takes place when indigo is reduced.—*Comptes Rendus*, Jan. 4, 1858, from *Chem. Gaz.*, Feb. 15, 1858.

NOTE ON VALERIANATE OF ATROPINE.

By M. MIETTE.

The organic valerianates are at present very few in number. Beyond the valerianate of quinine, first indicated at the Scientific

Congress of Florence in 1842, by Prince Louis Lucien Bonaparte, and investigated by him with great care, hardly any one was known except the valerianate of atropine.

To obtain this salt in the greatest possible state of purity, we must have recourse to the method employed by Prince Louis Lucien Bonaparte for the preparation of valerianate of quinine, as indeed was done by M. Michéa, who first procured it. A slight excess of valerianic acid is poured into a very concentrated alcoholic solution of atropine, and about twice its volume of distilled water is added to the mixture. Care must be taken to effect the saturation in the cold, as too intense a heat destroys the compound formed. The whole is exposed, in a shallow vessel, to spontaneous evaporation, or to the temperature of a warm chamber, not exceeding 122° F. The residue in the vessel after evaporation is valerianate of atropine.

Unlike valerianate of quinine, valerianate of atropine does not crystallize. It presents the appearance of a syrupous liquid, of a bright yellow color, which changes to orange in contact with the air. It has the fetid odor of valerianic acid, and deviates polarized light very slightly to the left. Its molecular rotatory power may be valued at -11.807 . It is very soluble in water, and its solution, which is at first neutral, becomes acid by evaporation.

Infusion of gall-nuts produces in it a much less rapid and abundant precipitate than that which it causes in the solution of atropine. Chloride of gold produces in it a citron-yellow color, without any very manifest precipitate. Tincture of iodine does not cause a brown color.

The aqueous solution of valerianate of atropine produces no turbidity in chloride of barium, but it precipitates the neutral aqueous solution of nitrate of silver. The precipitate is soluble in much water, and disappears entirely on the addition of a few drops of nitric acid. If the aqueous solution of valerianate of atropine be treated with mineral acids, even with the weakest, valerianic acid, recognizable by its odor, is evolved.—*Comptes Rendus*, December, 21, 1857, from *Chemical Gazette*, February, 15, 1858.

ON THE CLARIFICATION OF SUGARS AND SACCHARINE
MATTERS BY THE EMPLOYMENT OF SOAPS.

By M. BASSET.

This new method, discovered by Mr. F. Garcia, an old sugar manufacturer in Louisiana, obviates the inconveniences presented by the employment of hydrated lime for the clarification of the juices, at the same time retaining its real advantages. It is founded on the property possessed by lime of combining with fatty bodies either in a free state, or in the form of alkaline soaps. When saccharate of lime is brought in contact with a solution of soda soap, a remarkable decomposition takes place, in which the sugar is set free, the lime combines with the fatty acid of the soap, and the soda remains in the liquid, usually in a free state.

When clarification has been effected with an excess of lime and the scum has been removed, the liquid may be cooled below 104° F. and the solution of soap immediately made use of. It is poured gently into the syrup, which is stirred round; when the whole is well incorporated, the temperature is brought up to ebullition. At this point the temperature is suddenly lowered by stopping the access of steam, and the new scum is removed; this is nothing but a lime soap, which has brought up all the impurities from the bottom to the surface. After the removal of this scum, the syrup is perfectly limpid and in taste is very pure.

This process has been tried on a large scale at the factory of Messrs. Ponzel, near Lille. The experiments were made each time upon 10 hectolitres of syrup, and second and third molasses, and were always successful. With very dilute syrups, the calcareous soap does not always rise completely; in these cases a simple passage through the filter-bag and filtration through animal charcoal are sufficient for complete clarification. The syrups are perfectly pure and free from odor; the odor of beet having completely disappeared. Crystallization is effected readily, the crystals are large and well formed and the sugar is dry.

The quantity of soap to be employed varies, and may be carried to the complete saturation of the lime. It appears, however,

that half this quantity is sufficient, the beauty of the crystallization being greater when all the lime is not saturated. Syrups in a state of incipient fermentation must be saturated with alkali, as their carbonic acid destroys the saponaceous compound. No special apparatus is required.

The soap employed in the experiments was made with soda and olive-oil, but any soap may serve the same purpose. It must be more or less neutral according to the acid or alkaline qualities of the syrup to be treated, and the economy of its employment is increased by the fact, that the only expense is that of the soda for saponification and the acid for the decomposition of the calcareous soap, as the fatty matter serves almost indefinitely. The method also causes a considerable diminution in the employment of animal charcoal.—*Comptes Rendus*, Dec. 28, 1857, from *Chem. Gaz.*, March 1, 1858.

POISONING BY GRANULES OF DIGITALIN.

By DR. HEER.

A tall, well-formed lady, of a sanguineous temperament, took, for the purpose of killing herself, at seven in the morning, sixteen granules of digitalin, and, a few minutes afterwards, a cup of coffee. Two hours after, she was attacked with shivering and trembling, an impossibility of remaining on foot, vertigo, and strange hallucinations. At six in the evening, the patient took some food and another cup of coffee. A few minutes after, a fresh shivering fit came on, with chattering of the teeth, cold sweats, and dyspnoea; later, there was a return of the heat, great agitation, sleeplessness during the earlier part of the night, and persistence of the dyspnoea and vertigo. Relief from these symptoms, and sleep during the latter part of the night. At seven in the morning, finding that she had failed in her design, this lady took forty more granules.

In an hour she was attacked by hallucinations, vertigo, frequent shiverings, and cold sweat; nausea, abundant vomitings, colic without result, and extreme weakness; the patient in vain tried to feel her pulse beat.

During the evening the vomiting became more abundant, in-

creasing weakness, no action either of the bladder or bowels. Motion became impossible. The patient felt as if her eyes had become larger and were starting from their orbits.

These symptoms continued, with alternations of augmentation and diminution for seventy-two hours; at this time she at length consented to see a physician, who found the symptoms as described above, with extreme pallor of the face, very considerable exophthalmia of both sides, the eyelids wide open, conjunctiva of a lemon color, and the pupils much dilated; the skin cold and damp, the pulse small, weak, and intermittent, 46-48° pulsations, sometimes scarcely perceptible. The tongue dry, the thirst extreme, the epigastric region painful on pressure; no urine in the bladder.

The physician prescribed laxative injections, repeated sinipisms to the extremities, general friction with camphorated liniment, a cataplasim to the epigastrium, and lemonade.

Very little amelioration during the next twelve hours; to this treatment were added purgatives, and a weak infusion of coffee, and, later, black tea.

It was two days before the symptoms disappeared, and the weakness and sense of fatigue continued much longer than that.

The action of the bowels recommenced on the second day; the pulse likewise rose to 56-58, and the next day to 60-54; the urine reappeared on the second day, after a bath. The exophthalmia was several days before it disappeared.

This case is remarkable for the almost free development, for three days, of the symptoms peculiar to a large dose of digitalin. It tends to reassure us as to the consequences of this description of poisoning. It is true that the patient vomited abundantly, and we are therefore left in doubt as to the quantity of the poison introduced into the economy; but we must remember, in our prognostication, the property which digitaline has of causing vomiting, when taken in large doses.

The preceding case is not the first of the kind; M. Chereau published a very similar case, of which the following is a summary:

A lady with a very strong constitution swallowed quickly, for the purpose of poisoning herself, a quantity of granules of digitaline, which were estimated at least 40. This occurred an hour after dinner.

Half an hour after, she had administered to her 0.15 of tartar emetic which, combined with titilation of the throat, produced, after an hour, abundant vomiting (the vomited matters were not examined). Coffee and brandy were then given, purgative enemas and sinapisms were applied. During the night and following morning, the pulse fell from 72 to 60, 58, and finally to 52. There was cephalalgia, flushings of the face, and faintness. Coffee and brandy were continued all day, until they produced drunkenness. There was then reaction, and the patient slept towards evening. On the next day the symptoms had disappeared.

To complete the information on this serious subject I will give a third case of poisoning, in this instance involuntary, reported by M. Leroux, of Corbeny (Aisne), published in August, 1852.

The patient was a man of 72 years of age, of a vigorous constitution, with œdema of the inferior members, to whom had been prescribed two granules of digitalin each day. This man, who had always taken large pills, and with whom quantity was everything, judging that these small granules could have no action, took thirty, in two doses, in the same day.

Five hours after the first dose he had slight cephalalgia and nausea. Seven hours later (having taken the second dose in the meantime) there was extreme precordial anxiety; the tongue was rather charged and yellow at the sides, dryness and slight redness in the middle and at the tip. There was no thirst; in fact he refused drinks, as they induced vomiting. The abdomen was retracted, but without colic, no action of the bowels; the urine was scanty, of a reddish-brown, with an abundant brick-red precipitate. The extremities were cool, no sweating. The pulse full, regular, lowered from 68-70 to 48-50.

Heartsounds deep, having a great strength of impulsion; cephalalgia great and lancinating, flushings of the face, dimness of sight, delirium, and vertigo. The sensibility and intelligence perfect. No noise in the ears. General sinking and faintness.

As treatment, were employed—*ipécacuanha*, stibiated tartar, and purgative enemas; then coffee and rum, vinegar and water, and lemonade. On the third day, the bowels always returning the lavements without excrements, calomel, scammony, and cream of tartar were administered, which acted five or six times. The

patient passed a good night, and felt better; the urine was not so scanty, but high-colored. Nausea and headache continued; no appetite. In three weeks the patient had quite recovered, and was able to resume his customary occupation.—*Journal de Pharmacie et de Chimie*, Nov., 1857, from the *London Chemist*, Feb., 1858.

ON COLOR OBTAINED FROM COAL TAR PRODUCTS.

BY PROFESSOR F. CRACE CALVERT.

When, in November, 1854, I had the honor to read before the Society of Arts a paper on the products obtained from coal, I stated that ere long, besides carbo-azotic acid, some valuable dyeing substances would be prepared from this mineral. This expectation has been fulfilled. Messrs. W. Perkins and A. H. Church have obtained several blue coloring substances from the alkaloids of coal tar, and one from naphthaline, named by them Nitroso-phenylene and Nitroso-naphthaline, &c.

Mr. Perkins has lately taken out a patent for the commercial application of some of these beautiful purple blue colors, which he has succeeded in fixing on silk, a sample of which I have the pleasure to lay before you. This fine color, which rivals the delicate and admired color of orchil, has this great advantage over it, that it is not destroyed by light; Mr. Perkins has, therefore, solved one of the problems of the art of dyeing, viz., the production of a fast color similar to the fugitive one of orchil. Mr. Perkin's process consists in dissolving in water the sulphates of aniline, of cuminine, and of toluidine, and adding a quantity of bichromate of potash sufficient to neutralize the sulphuric acid in these sulphates. The whole is left to stand for twelve hours, when a brown substance is precipitated, which is washed with coal tar naphtha, and then dissolved in methylated spirits. This solution, with the addition of a little tartaric or oxalic acid, forms the dyeing liquor of Mr. Perkins.

Mr. Charles Lowe and myself have lately been fortunate enough to obtain from coal tar, products having a most extraordinary dyeing power, and yielding colors nearly as beautiful as safflower pinks and cochineal crimsons; and what increases

the interest of this coal tar product is, that by the process we have discovered, we can obtain with it, on a piece of calico mordanted for madder colors, all the various colors and shades given by this valuable root—violet, purple, chocolate, pink, and red. The only thing which has prevented us from introducing into the market the crown red inodorous paper which we prepare, has been, that it is as yet too expensive to compete with this extraordinary color-giving root, but we intend pursuing our researches in the hope of employing it as a substitute for safflower or cochineal, two coloring matters, the price of which is sufficiently high to induce us to continue our investigations. We may add that our imitation of safflower color stands soap and light, whilst safflower colors do not.

I shall now draw the attention of the meeting to the preparation, dyeing, and printing of a magnificent crimson color, called murexide, obtained from guano, a substance which, until lately, has been entirely imported for agricultural purposes. The interesting application of this color to calico printing has been, like many valuable chemical discoveries, progressive, and has only been brought to successful commercial speculation by successive discoveries, made by various persons.

Prout was the first chemist to remark, that if the fæces of serpents were heated with nitric acid, and a little ammonia added, a beautiful purple color was produced. He named it purpurate of ammonia. This substance, when dry, has the appearance of a dark-red powder, soluble in water, to which it communicates a magnificent red color. This solution not only gives a precipitate with metallic salts, but when evaporated yields beautiful crystals, having the iridescent appearance of the wings of cantharides.

This discovery has also been useful to medical men, by enabling them to distinguish the uric acid calculi.

Messrs. Liebig and Wöhler had also investigated the subject, and succeeded in obtaining from the uric acid contained in the fæces of serpents this substance, which they called murexide, and a new class of organic substances, the knowledge of which has much facilitated the application of murexide to dyeing and printing. Mr. Saac was the first to apply the products of uric acid to the dyeing of fabrics; his process consisted in dipping woollen fabrics, prepared with a salt of tin, into a weak solution

of alloxane, a product discovered by Liebig and Wöhler, in heating urea with nitric acid. The fabric so prepared was dried, and when submitted to heat, a fine crimson was generated, the intensity of which was increased by the fumes of ammonia. But owing to the difficulty of obtaining a color of uniform shade, Mr. Saac's process required improvements, and these have been effected by Mr. Schlumberger.

The process followed by Messrs. Saac and Schlumberger could not be applied to silk or cotton fabrics. The method of dyeing silk with murexide was discovered by M. de Pouilly, who adopted the following processes, viz., dipping the silk in a concentrated solution of bichloride of mercury mixed with murexide, squeezing the silk well and hanging it in the air, when a magnificent crimson insoluble compound is fixed on the silk. This effect is produced from the fact that when solutions of bichloride of mercury and murexide are mixed together, an insoluble compound is only formed after the lapse of an hour or two.

The process for dyeing cotton is due to Messrs. Lauth and Schlumberger, and consists in producing on cotton a purpurate of lead by mordanting with nitrate of lead, passing into an alkali, and then dyeing in a solution of murexide; in order to give full brilliancy to the color, it is lastly passed through a weak solution of bichloride of mercury. This process was further improved by Messrs. Dolfus, Meig & Co., in France, and Mr. Lightfoot, in Lancashire, by printing murexide with an excess of nitrate of lead, and subjecting the cloth so printed to the action of ammoniacal fumes, or passing it through a solution of caustic soda mixed with sal ammoniac. In order to render this substance more generally useful, it remained to find a method for obtaining fast colors with it on mixed fabrics, such as mouseline de laine, and this has also been effected by Mr. Schlumberger. The cloth is first prepared by uniting binoxide of tin with the wool. This object is attained by using a salt known to calico printers as pink salt, the double chloride of ammonium and tin, and then printing on the prepared fabric the following mixture:—

- 1 part of murexide.
- 6 parts of nitride of lead.
- 2 parts of nitrate of soda.

The pieces are then allowed to age for two or three days, when, to fix the purpurate of lead on the cotton, and the purpurate of ammonia on the wool, it is necessary to pass the cloth into a bath of bichloride of mercury, composed as follows:

Water	100 gallons.
Bichloride of mercury	6 pounds.
Acetate of soda	12 pounds.
Acetic acid	2 quarts.

Until recently, all the green colors produced on fabrics were the results of blue and yellow mixed together; but of late public attention has been drawn to a green matter discovered by the Chinese, and fixed by them on cotton. It has been ascertained that they prepare it by a long and tedious process, from two plants called Pa-bi-lo-sa (*Rhamnus chlorophorus*) and Hom-bi-lo-za (*Rhamnus utilis*), and sell it in small square cakes, under the name of Luh-kaou or Luh-chao. The first commercial importation of this color, new to us, is quite recent, as the first public sale of it in England took place a week ago, at the quarterly indigo sales, under the name of China green indigo. No sooner had a foreign green substance been brought to our notice, than in Europe we had succeeded in obtaining also a green dyeing substance from the plants which surround us, and Mr. Schlumberger has been fortunate enough to fix on woollen fabrics the green chlorophylle, or coloring matter of leaves and grass. This discovery will, in time, prove of great service to dyers and calico printers. Mr. Schlumberger's process consists in boiling 60 lbs. of grass with 25 gallons of water. This operation is repeated, and the grass then treated to 25 gallons of soda lye, with addition of 2 to 4 lbs. of Mercer's dung substitute (phosphate of soda and lime). Boil half an hour, and then add excess of hydrochloric acid; a green precipitate falls, which is separated by filtration. The precipitate is dissolved in very dilute soda lye, adding a little of the substitute, and the silk or wool to be dyed is dipped in until the desired shade is obtained. Stannate of soda is the only mordant which gives any beneficial results.

M. Pelouze has rendered lately a great service to Turkey red dyers by enabling them to use any oil, instead of only Gallipoli oil, and this of special quality. M. Pelouze has discovered that the difference there was betwixt a Gallipoli oil, which could

be employed with advantage to produce a Turkey red on cotton, and one which could not, was, that the first contained a large portion of free fatty acids, whilst the latter was nearly neutral. This led M. Pelouze first to prepare, artificially, oils of good quality for Turkey red by mixing oleic acid with neutral oils; and, secondly, to the interesting scientific observation that oils were susceptible of undergoing a spontaneous fermentation as well as saccharine juices, or other organic fluids. Thus, immediately the neutral fatty matters in the cells of fruits or roots are brought into contact with the ferment which all vegetable substances contain, by breaking the cells in which the fatty matters are deposited, the oil enters into fermentation, and the fatty acids are liberated from the glycerine with which they had been combined. This discovery gives us an insight into the acidity of some oils and the rancidness of others.—*London Chemist*, March, 1858.

PATENT GUM.

By PROF. CALVERT.

One of my late assistants, Mr. Edward Hunt, has just patented a discovery of much value to several trades, and especially to calico printers, who employ large quantities of various preparations of farina, sago, wheat, starch, and flour, as a substitute for gum arabic, to thicken the mordants and steam colors. We shall better appreciate the value of the discovery made by Mr. Hunt, when we reflect that hundreds of tons of the above preparations are employed annually, and that most of the substances used are articles of food, for by this discovery a great saving in quantity is effected, two pounds of Mr. Hunt's gum thickening as well as three pounds of ordinary calcined farina. This new gum presents also the three following advantages, viz., being nearly white, perfectly soluble in cold water, and this solution not being acid. The patent gum is manufactured by adding to one ton of dry farina 60 gallons of buttermilk, and calcining the whole in the ordinary way. Strange to say, the action of the lactic acid on the caseine and albumen of the buttermilk, is such as to render them, as well as the farina, soluble in water.—*London Chemist*, March, 1858.

EXAMINATION OF ALCOHOLIC LIQUIDS TO ASCERTAIN THEIR ORIGIN.

By M. MOLNAR.

According to this author, this process is applicable to alcoholic liquids which have apparently no foreign odor. It consists in introducing sixty grammes of the spirit to be examined into a flask containing two or three decigrammes of caustic potassa dissolved in water. It is well agitated, and the whole is subjected to evaporation until only five or six grammes remain. Then the residue is put into a bottle with a glass stopper, and about five grammes of dilute sulphuric acid are added; the characteristic odor is immediately diffused; this is especially true with regard to spirit from grain and from beet-root.

M. Molnar mentions incidentally that he has always succeeded in purifying spirituous liquors and freeing them from their essential oils, by using caustic potassa concurrently with recently-calced wood-charcoal.—*London Chemist*, March, 1858, from *Dingler's Polytechn. Journal*.

REMOVAL OF WARTS BY CHROMIC ACID.

By I. L. CRAWCOUR, M. D., etc.

In a late number of the *Medical Times and Gazette* appeared some experiments by Mr. Marshall, on the use of chromic acid. Two cases have recently come under my own observation, and the results have been very satisfactory. A gentleman called on me about three months ago, complaining of a wart on the top of his head; it was about the size of a twenty-five cent piece, and the extremity was rough and split vertically. He had suffered from it for several years, and it gave him a great deal of trouble, bleeding whenever he combed his head. I painted it thoroughly by means of a glass brush, with a saturated solution of chromic acid. The remedy produced little pain, the surface of the wart instantly blackened, and twelve days afterwards a scab fell off, leaving a clear reddish surface underneath, and perfectly smooth. I examined this gentleman's head a few days ago; the skin is now perfectly healthy, and hair is growing on it. About two

weeks ago, another case presented itself, of a similar character. I applied the same remedy. The scab, however, has not yet separated, but I fully expect the result to be identical with the former. The advantage of this caustic is, that it leaves no scar, and does not destroy the hair-bulbs when applied to the scalp. Its influence is undoubtedly owing to the readiness with which it parts with its oxygen, yielding half of its oxygen when applied to organic substances, passing to the state of green sesquioxide of chromium—this being the most powerful oxydiser we possess. Its preparation is very simple. Make a saturated solution of bichromate of potash, and add strong sulphuric acid as long as any precipitate of chromic acid falls; pour off the supernatant liquor, and dry the residue on a tile or brick. I prefer filtering through a glass funnel partially filled with asbestos. In preparing it, caution must be used not to allow any organic substance, as paper or wood, to come in contact with it, as instant decomposition ensues. The solution I employ is one part chromic acid and one part water.—*London Chemist, March, 1858, from New Orleans Med. News, Nov., 1857.*

Varieties.

Method of purifying Castor Oil of Commerce. By M. PAVESI. Take 1000 parts of the oil to be treated, 25 parts of purified bone black, 10 parts calcined magnesia. Mix these carefully in a convenient vessel of glass or tinned iron, and let it stand during three days, with occasional agitation, and filter through paper or felt. Thus obtained, the oil is less viscid, limpid, nearly colorless, of a sweet taste, inodorous, very soluble in alcohol, and bears an intense cold.—*Repertoire de Pharmacie, Sept., 1857.*

Ancient Quack Medicines.—It will appear from the following, copied from the records of Massachusetts, that the early fathers of the commonwealth were more severe upon quacks than we are: "Nich. Knopp is fined five shillings for takeing upon him to cure the scurvey by a water of no worth nor value, which he sold at a very dear rate; to be imprisoned till he pay his fine, or give security for it, or else to be whipped, and shall be liable to any man's action of whom he has received money for the said water."
—*Med. and Surg. Reporter.*

The following is valuable both as to form and reliability :

Acid Sulphate of Zinc Paste.—Among the new forms of caustic which the recent discussion respecting them has been the means of bringing into use, one of the most convenient appears to be the sulphate of zinc with sulphuric acid. The powdered salt is moistened with the concentrated acid, and applied in a paste form to the sore. It has been proposed, and successfully employed in one or two cases, by Mr. Henry Thompson. A great recommendation is, that its ingredients are always at hand, and easily manipulated. Its efficiency also appears to be great, and the resulting cicatrix soft and good.—*Eclectic Med. Journ.*, April, 1858, from *Med. Times and Gaz.*

Arsenic in Paper-Hangings.—Dr. Alfred Swaine Taylor, in his evidence before the Select Committee of the House of Lords, last session, on the Sale of Poisons Bill, after pointing out that arsenic was much used in several manufactures, such as in the manufacture of glass, especially of opal glass, of shot, in the steeping of grain, and in killing the fly in sheep, states that the largest quantity of arsenic used in this country is used in the manufacture of paper for covering walls. He considered it very injurious both to those living in a house papered with this article, as well as to those employed in the manufacture. An instance was published in a medical work of some cases of illness occurring to persons living in a room papered with this paper; and the effects were described as those arising from arsenic. The color, says Dr. Taylor, is put on very loosely; it contains nearly fifty per cent. of the poison. In addition to the above, Dr. Taylor handed to the Committee an envelop, the green tint on the inside of which he examined, and found to be formed of arsenite of copper. There is also an orange yellow which contains arsenic.—*British Med. Journ.*, from *Med. News*, April, 1858.

Citrate of Iron and Strychnia a new Therapeutic Agent.—For a long time back a therapeutic agent of very efficient properties has been used with considerable success at the Royal Free Hospital in cases of dyspepsia of an atonic character by Dr. O'Conner. He has also found it productive of great benefit in similar conditions depending on functional derangement of the uterus. In these cases it acts as an emmenagogue when all other remedies have failed, and it has a powerful effect in tranquillizing the excitement of the nervous system. This preparation is a citrate of iron and strychnia, the dose of which is about three grains three times a day, to be taken immediately after a meal. There is now a case of chorea in the Hospital under the care of Dr. O'Connor, immediately brought on by the patient being frightened by a thunderstorm in August last, since which time she has, without any intermission of the symptoms, been a sufferer. In this case the citrate of iron and strychnia has been only used for a few days, and already

with marked benefit. The case is one of interest, and we propose at a future time giving it in detail. The preparation which Dr. O'Connor uses is made by Mr. Bastick, of Brook Street, Grosvenor Square.—*Med. Times and Gaz.*, from *Med. News*, April, 1858.

[No indication is given of the per centage of strychnia in this salt, which, we presume, is an empirical compound like citrate of iron and quinia—as three grains is the dose mentioned it is probable that the quantity of strychnia it contains is not over 1-16th of a grain—so that in attempting to make the preparation, the ratio of 1 to 48 should be borne in mind by the apothecary. We would suggest the following formula:—Citrate of iron, with excess of acid, 480 grains, strychnia 10 grains, water four fluid ounces. Triturate the strychnia with a portion of citrate of iron, and add it, with the remainder, to the water, previously heated in a capsule, and stir till dissolved—filter if necessary, evaporate to a syrupy consistence, and dry on glass.—EDITOR AMER. JOUR. PHARM.]

Poisoning by Cyanide of Silver.—A man lately drank by mistake, instead of water, a tumbler full of a solution of cyanide of silver, from a large jar near which was standing the tumbler, at an electrotype establishment in New York. Instantly discovering his mistake, a quantity of lamp oil was administered, with a view to make him vomit. A physician was called, who administered emetics without effect. The patient was then taken to the City Hospital, where he died shortly after being admitted. A *post-mortem* examination showed that the lining membrane of the stomach was entirely destroyed, and the brain and left lung congested. Had the jar been marked "*poison*," the fatal mistake would not probably have happened.—*Boston Med. and Surg. Journ.*, Feb., 1858.

The Electric Conductivity of Copper Wires.—Professor W. Thomson, in measuring the resistance of wires manufactured for submarine telegraphs, was surprised to find differences between different specimens so great, as most materially to affect their value in the electrical operations for which they are designed. It seemed at first that the process of twisting into wire rope and covering with gutta percha must be looked to, to find the explanation of these differences. After, however, a careful examination of copper wire strands, some covered, some uncovered, some varnished with India-rubber, and some oxydized by ignition in a hot flame, it was ascertained that none of these circumstances produced any sensible influence on the whole resistance, and that while there is some degree of constancy in the quality of wire supplied from the same manufactory, there is a vast superiority in the produce of some manufactories over that of others. A submarine telegraph constructed with copper wire of one manufactory of only 1-21 of an inch diameter, covered with gutta percha to a diameter of a quarter of an inch, would, with the same electrical power, and the same

instruments, do more telegraphic work than one constructed with copper wire of another manufactory of 1-16th of an inch diameter covered with gutta percha to a diameter of a third of an inch. What is the cause of these differences in electrical quality, is a question of much practical importance and high scientific interest. The result of experiment shows that the greatest degree of brittleness producible by tension does not alter the conductivity of the metal by as much as one-half per cent. A similar experiment showed no more sensible effect on the conductivity of copper wire to be produced by hammering it flat. There are no doubt slight effects on the conductivity of metals produced by every application, and by the altered condition left after the withdrawal of excessive stress; but these are found to be in all cases so minute, that the present results as to copper wire are only what was to be expected.—*Journal Franklin Institute, April, 1858, from London Mechanic's Magazine, July, 1857.*

The Great Blast at Holyhead.—In presence of upwards of 1,000 persons, a portion of the Holyhead mountain, which is 122 feet in height, was displaced, on the 21st inst., by a blasting operation of unparalleled magnitude. The removal of a considerable portion of the mountain is necessary for the formation of the new harbor of refuge, which is now being constructed under the superintendence of Messrs. J. and C. Rigby, who personally superintended the operations, assisted by Mr. G. C. Reitheimer, the resident engineer of the firm. Two or three of these operations have already taken place, and so eminently successful were they, as to induce the engineers to attempt another on a much larger scale. The arrangements contemplated the displacement of 120,000 tons of rock, by the application of 18,000 lbs. of gunpowder. At the last moment, the engineers determined still further to extend the operation, and for this purpose two additional chambers of mines were prepared, making the weight of gun-powder used 21,500 lbs., and the body of rock displaced no less than 160,000 or 200,000 tons, being far more than could have been calculated on. At a given signal, all the chambers were simultaneously ignited, and the huge body of the rock and mountain was upheaved, and fell down on the side in large fragments of several tons each. It will be removed by railway, for the purpose of completing the breakwater, from which it is about two miles distant.—*Journal Franklin Institute, March, 1858, from London Builder.*

Minutes of the Philadelphia College of Pharmacy.

At the Annual Meeting held 3d mo. 29th, 1858. The President in the chair.

The minutes of the last meeting were read and adopted.

The minutes of the Board of Trustees for the past six months were read; from these it appears that the following have been elected members of the College:

Charles Shivers,	Adam H. Wilson,
Theodore Dilkes,	J. Bloomfield Wetherill,
Matthew M. Selfridge.	

The following candidates, recommended by the Board, were separately ballotted for, S. S. Garrigues acting as teller, and were declared unanimously elected:

William H. Squire,	John Field,
J. Lewis Crew,	Alfred Tatam.

At the Annual Commencement, held on the 11th inst., the following gentlemen having complied with the requisitions for graduation, were declared Graduates in Pharmacy:

FREDERICK J. BROWN,	Pa.	Pæonia officinalis.
RAPHAEL CABE,	Cuba,	Progress of Pharmacy.
JOHN W. CADBURY,	Pa.	Podophyllin.
JOHN E. CARTER,	"	Colchicia.
JOSEPH K. CORSON,	"	Podophyllum peltatum.
GEORGE H. DICK,	"	Caloric.
EDWARD R. FELL,	"	Formic Acid.
FRANCIS A. FIGUEROA,	Cuba	Cerasus serotina.
PETER P. FUCHS,	Ger.	Hedera helix.
AMOS HANSELL,	N. J.	Colchicia and Veratria.
B. B. HENSHEY,	Pa.	Gillenia trifoliata
F. VICTOR HEYDENRICH,	France,	Capsicum annuum.
WILLIAM HOLLEMBACK,	N. Y.	Radix Sambuli.
E. W. INSKEEP,	Pa.	Podophyllum peltatum.
GEORGE L. JAMESON,	"	Ceanothus Americanus.
WASHINGTON LAYCOCK,	Mich.	Chimaphila umbellata.
CHARLES A. McDERMOTT,	Pa.	Chimaphila umbellata.
JOHN Q. MILES,	"	Gossypium herbaceum.
ALBERT V. NOLEN,	Mass.	Veratrum viride.
ROBERT H. SEILER,	Pa.	Colchicin.
OLIVER G. SHERMAN,	Va.	Collodion.
LEWIS T. SILLYMAN,	Pa.	Eryngium aquaticum.
ISAAC W. SMITH,	"	Extractum Krameria.
HALLAM H. SPENCER,	"	Marrubium vulgare.
JOHN J. STELL,	"	Matico.
WILLIAM B. THOMPSON,	"	Pharmacy.
FRANK J. TOURTELLOT,	"	Polygonum hydropiper.
WILLIAM H. WARNER,	N. J.	Anthemis cotula.
THOMAS D. WEISER,	Pa.	Leptandra Virginica.
PIERCE B. WILSON,	Ga.	Gossypii Herbacei Radix.
EDWARD ZEITLER,	Pa.	Gelsemium sempervirens.

The Committee to confer with the Board of Trade, &c., were, on their own motion, discharged.

Bradford Ritter resigned his membership in the College—accepted.

The Annual Report of the Publication Committee was read, as follows :

"The Publishing Committee respectfully Report, that the Journal has been regularly issued since the last annual meeting of the College. Owing to a sudden increase in subscribers last Spring, and to the resolution of the College entitling each member to a copy of the Journal, the volume for last year became deficient in several of its numbers, so as to require the printing of a larger aggregate. This deficiency may hereafter render it advisable to reprint part of the volume, in order to furnish complete sets of the last series.

CHARLES ELLIS,	} On behalf of Committee."
WILLIAM PROCTER, JR.,	
ALFRED B. TAYLOR,	
EDWARD PARRISH,	

The Publishing Committee have ceased to employ one of the parties and his agents who formerly made the distant collections for the Journal, and by sending the bills direct to the subscribers, though the postage has been increased, yet a large amount has been saved the College.

The Committee on Latin Labels reported—

"That since last year, they have printed three editions of labels ; one edition of 250 books of fine bronze ground on steel blue paper, with dark letters, and of superior finish ; the second, an edition of 1000 copies on yellow paper, with black letters, similar in form to the finest bronze ; the third, an edition of 2000 copies of labels on yellow paper, suitable for physicians ; the whole were completed about the first of the year, at an expense of near \$3500.

From the balance on hand at last report, they have paid to the Committee on repairing the College \$150 ; with the balance and funds arising from sales of the present editions, they have made payments for editing and printing of the above, amounting to \$1110 00, and have made arrangements for meeting the other payments as they fall due.

CHARLES ELLIS,
WM. PROCTER, JR.,
EDW. PARRISH."

The Auditors appointed to examine the accounts of the Treasurer of the Sinking Fund, reported them correct.

The annual election for officers was held, and resulted as follows :

President.—CHARLES ELLIS.

1st Vice President.—Samuel F. Troth.

2d Vice President.—Dillwyn Parrish.

Recording Secretary.—Edward Parrish.

Corresponding Secretary.—Wm. Procter, Jr.

Treasurer.—Ambrose Smith.

Trustees.

Dr. Robert Bridges,
T. S. Wiegand,
S. N. James,
D. S. Jones,

H. N. Rittenhouse,
F. C. Hill,
S. S. Bunting,
J. C. Savery.

Committee on Sinking Fund.

Samuel F. Troth,

Ambrose Smith,

Edward Parrish.

Publication Committee.

Charles Ellis,
Wm. Procter, Jr.,

Dr. R. Bridges,
Edw. Parrish,

A. B. Taylor.

Delegates to the American Pharmaceutical Association.

Edward Parrish,
Ambrose Smith,

Dr. W. H. Pile,
Charles Bullock,

S. S. Garrigues.

Editorial Department.

TO OUR READERS.—We perhaps owe an apology for occupying so much space in this number with what some may deem an unprofitable lecture. Why it appears, is explained at the first page. We trust that the richness of much of the original matter that follows it will make up the deficiency to such as may view it askance. The papers on Colchicia, Collodion, and Hypophosphite of Lime particularly merit attention among the original articles, and the valuable communications of Prof. Herapath, in reference to the alkaloids of Cinchona, of Mr. Schacht on "*Plasma*," or "*Glysamyl*" as it called, by Mr. O. S. Hubbell of this city, and of Dr. Garrod on the decomposing action of the Alkalies on the Narcotics, deserve a careful perusal.

MARYLAND COLLEGE OF PHARMACY.—We are informed, by Prof. Grahame, of this Institution, that Dr. Frick, their Professor of Materia Medica, has been elected to the chair of Materia Medica in the University of Maryland, and that the vacancy thus occasioned in the faculty has been filled by the election of Dr. Donaldson, of Baltimore. Dr. Frick won golden opinions among those who listened to his lectures at the Maryland College, and we doubt not, in the more extended sphere of action to which he has been called, that he will become eminent as a teacher of the interesting branch that he has made a speciality.

SAN FRANCISCO PHARMACEUTICAL ASSOCIATION.—We learn, through the Pacific Medical Journal for March, that the proposed organization of Phar-

maceutists, alluded to in that Journal for February, took place on the 11th of the latter month. After some discussion, a Constitution was adopted for "THE SAN FRANCISCO PHARMACEUTICAL ASSOCIATION." The following notice of the meeting we extract from the Pacific Medical Journal, viz.:

The Apothecaries and Druggists of San Francisco, feeling the necessity of association for the purpose of promoting friendly intercourse with each other, and for the general advancement and interest of the profession and welfare of the public, have lately formed an organization for that object.

After several preliminary meetings, in which the subject was freely discussed, a Constitution was adopted, and Thursday evening, February 11th, was appointed for signing the Constitution and election of officers.

Feb. 11th.—There was a full attendance. The meeting was called to order, and Samuel Adams appointed Chairman. The Constitution was then signed, and the nominations were made and balloted on with the following result: M. J. Burke, President; Wm. B. Little, 1st Vice President; Chas. Langley, 2d Vice President; Chas. Morrill, Cor. Secretary; J. H. Widber, Rec. Secretary; Wm. Brigham, Treasurer; Samuel Adams, Robert Hagen, Chas. Hodge, M. J. Burke, J. H. Widber, Trustees.

The President having taken the chair, a motion was made by Wm. B. Little that a Committee be appointed to confer with the State Medical Society as to the most proper legislation, with regard to the importation and vending of drugs and medicines.—Carried.

Committee—M. J. Burke, Wm. B. Little, Chas. Morrill and Henry Johnson.

The meeting then adjourned to Thursday evening, February 18th.

Feb. 18th.—Met, pursuant to adjournment, Wm. B. Little in the chair. Minutes of the previous meetings read by the Secretary, and ordered to be placed on record. Committee on Legislation reported progress, and asked farther time.—Granted.

On motion of C. Morrill—

Resolved, That notice be given to Apothecaries and Druggists throughout the State of the formation and objects of the Association, and soliciting their co-operation by forming similar organizations.

After various other business, the meeting adjourned to Thursday evening, February 25th.

We shall be pleased to hear, through some of our friends in California, of the progress of the new Association.

LEGISLATION FOR PHARMACY IN CANADA.—Through the Montreal Medical Chronicle, for April, we are informed that a bill has been drawn up and submitted to the members of the College of Physicians and Surgeons of Lower Canada for the regulation of Apothecaries. The proposed bill is divided into ten sections, some of the provisions of which are of the most arbitrary character, and should be resisted by the pharmaceutical body of Canada as an oppressive interference with their rights and privileges; such an interference as would not be tolerated in England. In fact the parliamentary movement in 1840, which called forth the resistance of the London chemists, and resulted in the formation of the Pharmaceutical Society, was

not so oppressive as this proposed measure. We doubt not that the pharmaceutical body of Canada need improvement, but let the amelioration come from their own exertions, in their own way, under the sanction of the Canadian Parliament. To this end the Canadian apothecaries should bring forward a counter bill, undertake to educate and regulate themselves under the direction of a provincial Society of Pharmacy, and by its means raise their status and accomplish all the changes considered desirable by the College of Physicians.

The following is a brief view of the Bill :

1st. Provides, very properly, that every person who shall practice Pharmacy shall be twenty-one years of age, and shall have served a regular apprenticeship of three years to the business. It also requires that he shall have a diploma from the College of Physicians, certifying to his examination by its Board of Governors.

2nd. Every such practitioner shall have had a sound elementary education, be of good moral character, shall have attended a course of lectures on medical jurisprudence and two courses on materia medica and chemistry, each of six months' duration, at some recognized *medical* college.

3d. Enacts that every person practising pharmacy for gain, without a diploma, shall be fined five pounds for the first offence, ten pounds for the second, and twenty pounds for the third offence, and, on conviction by court, imprisonment in jail.

4th. This clause enacts, that the Board of Governors of the College shall regulate the fees to be paid by all candidates for license to practice as apothecaries, chemists and druggists, provided the amount of such fees shall not exceed fifteen dollars, &c.

5th. Requires every licensed apothecary to have his diploma registered by the Registrar of the College of Physicians and Surgeons.

6th. Enacts that every apothecary who vends an adulterated or spurious medicine shall be fined five pounds for the first, and ten pounds for the third offence, &c.

7th. This clause is in reference to the sale of poisons, requiring each sale to be preceded by a certificate from a physician, clergyman, or justice of the peace, addressed to the vendor, to be kept in evidence ; and for not so complying, the apothecary to be finable two pounds currency for each offence.

8th. Provides for the keeping of arsenic, strychnia, corrosive sublimate, etc., in "a private and safe place," and in yellow bottles, legibly labelled ; and inattention to it to be met by a penalty of five pounds.

9th. Gives the Board of Governors the power to appoint a committee of three of their number to visit the shop of any apothecary, between the hours of 10 o'clock, A. M., and 3 o'clock P. M., to see if the above requirements are attended to, and each refusal to admit such visitors shall incur a penalty of five pounds on conviction.

10th. Refers to the manner of collecting fines.

BESTUCHEFF'S TINCTURE OF CHLORIDE OF IRON.—We have received the following:

"**PROF. PROCTER:**—I would like to call your attention to the article by A. Cushman, (*Am. Jour. Pharm.*, 1857, vol. v. p. 460) on *Ethereal Tincture of Sesqui-chloride of Iron*, as I suppose it is not, as headed, a *sesqui* but a *proto* chloride of iron. Also to a statement of its composition, which, the writer says, "consists of the green crystals of sesqui chloride of iron, &c. &c. According to the authorities I have in my possession the chloride mentioned is *proto*, not *sesqui*; and moreover, in the formula for its preparation, if light green crystals are produced it is owing to an insufficiency of NO^5 to oxidize. If changed into sesqui-chloride by standing I should think more H,Cl was necessary to form the salt; and also how or why is the characteristic taste of the sesqui chloride of iron so lost in the resulting preparation.

With much respect I remain,

THUJA.

Thuja is correct in believing that Mr. Cushman's *sesqui*-chloride is mainly *proto*-chloride. He says in his paper that the first crystals are colored with sesqui oxide (*sesqui*-chloride) and have to be washed with alcohol, thus removing the greater part of the *sesqui*-chloride formed in his process. This result is the effect of using a deficiency of nitric acid. Probably the nitric acid he employed was much weaker than that of *U. S. P.* In the phenomenon of decoloration by sunlight sesqui chloride of iron becomes *proto*-chloride and free chlorine, which last reacts on a portion of alcohol to form hydrochloric acid and aldehyde. The hydrochloric acid then reacting with another portion of alcohol, or of the ether, produces chloride of ethyle and water. *Proto*-chloride of iron is soluble in alcohol and spirit of ether, (but not in pure ether) hence the resulting salt is retained in solution as a mild neutral *proto*-chloride, quite different in its character from the acidulous sesqui salt.

CAVENDISH SOCIETY.—After an interval of eighteen months another volume has issued from the press of this useful Society. The 11th volume of Gmelin's *Hand-book of Chemistry*, the fifth of the *Organic series*, has just been received and distributed to the members. As this is the first volume for 1857, all members who have not paid their subscriptions for 1857 should forward the amount to "W. Procter, Jr., 500 South Ninth St., Philadelphia," who is one of the Local Secretaries for the Society. The local secretary takes this opportunity to say that those members who subscribed for the 1st and 2nd volumes of Lehman's *Physiological Chemistry*, and have not yet procured the 3d volume, may get it on application. The Secretary has also two or three complete copies of Gmelin's *Hand-book*, as far as published, (11 volumes), and several of Laurent's *Method of Chemistry*, the *Life of Dalton* and Bischof's *Chemical Geology*.

NEW SYDENHAM SOCIETY.—The inaugural meeting of this Society was held on Monday, Jan. 18th 1858, and resulted in the election of Dr. Wil-

liams, F.R.S., *President*, and Sir Henry Holland and a long list of others as *Vice-Presidents*, Dr. Barlow as *Treasurer*, and Dr. J. Hutchinson as *Secretary*, besides a council of management. The objects to which the new Society will direct its attention are the following:

"I. The translating and editing of valuable foreign works on Medical Science, as also of important papers which may have recently appeared in foreign journals, transactions of Societies, etc. These works, papers, etc., will be translated in full, and brought out as early as possible after their original publication.

"II. The reproduction of British works, lectures, and papers, which, while of great practical value, are out of print or difficult to obtain, excluding the works of living authors.

"III. A Year-Book of Reports in abstract of the different branches of Medical Science, compiled by a Committee.

"IV. Should the funds prove adequate, it is proposed also to prepare volumes of Medical Bibliography and Medical Biography."

Our readers, familiar with the course of the old Society, will perceive quite a change in the objects, the new Society aiming chiefly at modern works and ideas as developed in papers published in foreign languages. The subscription is one guinea sterling in advance annually.

The Dispensatory of the United States of America. By GEORGE B. WOOD, M.D., Professor of the Theory and Practice of Medicine in the University of Pennsylvania, &c., and FRANKLIN BACHE, M.D., Professor of Chemistry in Jefferson Medical College, &c. Eleventh edition, carefully revised. Philadelphia. J. B. Lippincott & Co. 1858. Pp. 1583, octavo.

The tenth edition of the U. S. Dispensatory was published in July, 1854, nearly four years ago. The previous edition was issued in 1851. Although since the middle of 1854 there have been no Pharmacopœias revised which would cause any extensive changes in the details of the work, yet so many have been the observations and discoveries in materia medica and pharmacy, that the authors, with the idea constantly in view of the necessity of compression into one volume, have felt it necessary to swell the book over one hundred pages. Of these, forty have been added to the part on materia medica, and the remainder nearly equally divided between the *second*, or pharmaceutical part, and the *third*, or description of non-official drugs, preparations and chemicals. The third part of the present edition includes that portion of the appendix to the former editions which was embraced in small type, and which from its great increase in size and the variety of valuable articles it contains has been erected into a distinct division. The present "Appendix" includes "the art of prescribing, the tables of weights and measures, the table of pharmaceutical equivalents and those of specific gravity for hydrometers. The table of equivalents

has been considerably extended, and many chemical formulæ introduced that have been needed in laboratory calculations.

It would be useless in a limited space to enter into even an enumeration of the additions that have been made in this edition, nor has our time been sufficient to compare it with the preceding; yet from a general glance over we observe the same attention to accuracy in details which have heretofore so eminently characterized the work. It has been the aim of the authors to make the Dispensatory as comprehensive as possible; much it contains in close foot-notes, and many valuable results are condensed in short paragraphs of the text; where several have written on the same subject, abstracts of each are given where each possesses merit. This will be noticed at the articles "Tinctura Ferri Chloridi," Strychnia, Cinchona, etc. So much has been discovered in relation to the ethers that Dr. Bache found it necessary to almost wholly reconstruct that abstruse chapter, and the same may be said of that on Glycerin. We hope to be able hereafter to point out more in detail the new features of the Dispensatory, but must conclude the present notice with the opinion, that it in all respects keeps up its well earned character, as a guide book in materia medica and pharmacy to the physician and apothecary, as well to the practitioner in his office or shop, as to the student.

As regards the mechanical execution, the printer has done well; but in regard to paper the publisher might have done better; yet the anxiety to compress the size of the volume may excuse the deficiency in this respect.

Elements of Inorganic Chemistry; including the applications of the Science in the Arts. By THOMAS GRAHAM, F. R. S., L. & E., &c. Edited by HENRY WATTS, B. A., F. C. S., and by ROBERT BRIDGES, M. D. Second American, from the second revised and enlarged London edition. Complete in one volume, with 233 illustrations on wood. Philada. Blanchard & Lea, 1858: pp. 852.

In 1852, the first part of this work, including the non-metallic bodies, and the alkaline and earthy metals, amounting to over 430 pages, was published in this city under the revision of Prof. Bridges, from the London edition. Owing to circumstances, the principal of which has been, no doubt, the engagements of the author in the Royal Mint, he has not found time to go on with the work, and it remained in the condition it was left by the author in 1852, until recently, when Wm. Henry Watts, F. C. S., well known as the translator of Gmelin's Hand-book for the Cavendish Society, engaged to edit the remainder of the work, under the superintendence of the author, and has written an extensive supplement of 200 pages, which applies chiefly to the first part previously published, thus bringing that very important portion up to the present condition of science. In the last part of the text just brought out an important feature is "the

systematic introduction of the best processes for the separation and quantitative estimation of metals and other important substances, in addition to the description of their properties and reactions. The new methods of *volumetric analysis* are detailed, with the description and applications in particular of Bunsen's General Method."

The subjects particularly treated of in the Supplement are, "The determination of the most important physical Constants, viz.: The Mechanical Equivalent of Heat; the relations between the Chemical and Magnetic effects of the Electric Current, and the reduction of its force to Absolute Mechanical Measure; also the measurement of the Chemical Action of Light. The polarization of light is treated of in sufficient detail for the wants of the chemical student, attention being especially directed to the methods of Optical Saccharimetry, and to the very remarkable relations between Crystalline form and Molecular Rotatory power, discovered by Pasteur."

The latest ideas in reference to the constitution and classification of chemical compounds are treated of according to the views of Gerhardt's Unitary System, as also are the formation and reactions of the principal classes of organic compounds.

"The last portion of the Supplement contains the most recently discovered facts relating to the non-metallic elements and the alkaline and earthy metals, a prominent place being assigned to the allotropic modifications of certain elements, viz.: Boron, Silicon, Sulphur, Selenium and Phosphorus, and to the methods of obtaining the alkalis and earths in a free state." The whole forms a volume nearly double the size of the inorganic portion of the old edition. Whether Prof. Graham intends to give another volume on Organic Chemistry, is not stated; but be this as it may, the present volume is complete in itself, and forms the most recent exposition of Chemistry published in English, and of great value to the student.

We have not had time for this number even to attempt a critical examination of the work, and perhaps had better leave the task for abler hands, but we cannot but express our gratification at the completion, thus far, of this valuable treatise, and hope that the author will yet do for the organic part what has been done for the inorganic portion. Judging from the many references to the Supplement in the first part of the volume, it would appear that the publishers have reprinted the entire volume.

The typography and paper are excellent, and the numerous illustrations well designed.

The Peninsular and Independent Medical Journal devoted, to Medicine, Surgery and Pharmacy. Edited by A. B. PALMER, M. D., MOSES GUNN, M. D., and FREDERICK STEARNS, Pharmaceutist. April, 1858. Vol. 1. No. 1.

We have received the first number of this Journal, of which our friend Stearns is co-proprietor and co-editor, and have directed it to be placed on our list of exchanges. We feel confident that the pharmaceutical element

will add to, rather than diminish the interest of medical men in the Journal, whilst with proper management it may be made an organ for the development of pharmaceutical talent in the northwest.

Report on Fluid Extracts, read before the New York Academy of Medicine, Dec., 1857, by SAMUEL ROTTON, M. D. Pp. 7, octavo.

It appears, from this pamphlet, that the New York Academy referred to the Section on *Materia Medica* a large number of fluid extracts for examination, which eventually were referred to the author as a sub-Committee, who has reported on some of them therapeutically and analytically. They include the fluid extracts of *Veratrum viride*, of *Jalap*, of *Cannabis Indica*, of *Ergot*, of *Rhubarb*, of *Ipecac*, of *Red Peruvian Bark*, and of *Calisaya Bark*. He found them all deficient in medicinal power, and on analysis gave indication of being much weaker than theory requires; in a word, Dr. Rotton has examined a lot of inferior fluid extracts, and on the result, condemns the whole class of preparations, as liable to vary in strength, by design, carelessness or natural deficiency in the drugs themselves. His remedy is to employ only the active principles of plants, and discard galenical preparations as too variable to be relied upon. This suggestion is obnoxious to the objection that active principles are more easily adulterated than plants or roots, that they are not so easily judged of by the general range of apothecaries. Hence, although these principles, when pure, may be relied on as uniform, and not liable to change by keeping, they are, as yet, too few in number, and many of them too expensive, to be employed in general practice. Our space does not admit of further remark, but we expect to resume the subject.

OBITUARY.—DR. JOHN FORBES ROYLE. Just after closing our columns for the March number, we learned, through the *Pharmaceutical Journal* for February, of the death of Dr. Royle. So soon after Pereira, the death of Royle will leave a void in the department of medical science he so ably illustrated, not easily filled. The position of an authority of the first magnitude in *materia medica* is only attained by long continued exertion, as, however great may be the talents of an individual, it is observation that gives value to his writings on this branch; he must labor with his own faculties, collect specimens from every available source, and verify statements by experiment. It was in this way that Pereira attained to his exalted position as a Pharmacologist. Dr. Royle's duties as Inspector in the employ of the East India Company gave him great facilities in the study of drugs from the East. It is to his influence that our College (through the kindness of Mr. Yarnall) received a valuable accession to its museum. The following account, from the *London Athenæum*, is extracted from the *Pharmaceutical Journal*:

Science has sustained a loss in the death of Dr. Royle, which took place at his residence, Heathfield Lodge, Acton, Middlesex, on Saturday, Jan.

2d. He had been for many weeks in ill health, but his death was sudden at last. Dr. Royle was educated in London for the medical profession, and was a pupil of the late Dr. Anthony Todd Thomson, from whom he seems to have acquired that taste for the study of botany which afterwards distinguished him. Having passed his medical examinations, he entered into the service of the East India Company, and was for many years stationed in the Himalaya, where he had great opportunities afforded him of studying, not only the plants of that district, but of the whole empire. He was appointed superintendent of the East India Company's Botanic Garden at Saharempore—a position which gave him the largest possible opportunity for studying the indigenous Flora of Hindústan. The result of his labors was given to the world in a magnificent work, entitled "Illustrations of the Botany and other branches of the Natural History of the Himalayan Mountains, and of the Flora of Cashmere." This work was published, in folio, with plates, in 1833, and at once gave to the author a European reputation as a botanist. In this work Dr. Royle gave the result of his researches into the medical properties of a large number of plants, as well as the history of drugs used in Europe, whose origin was unknown. In 1837 he published an essay "On the Antiquity of Hindoo Medicine," a work displaying much learning and research. On the opening of King's College, London, as a medical school, the knowledge of drugs and plants possessed by Dr. Royle pointed him out as a fit person to hold the chair of *Materia Medica*, a position which he filled till the year 1856. Whilst lecturing on this subject he published his "*Manual of Materia Medica*," a book which is now used as a text-book on the subject in medical schools. His extensive knowledge of the natural history of India made him a valuable contributor to the periodical scientific literature, and he was a contributor to the "Penny Cyclopædia" and Kitto's "Dictionary of the Bible," and other works. He took an active interest in promoting a knowledge of the material resources of India; and, in 1840, produced a work which, perhaps, will be read with more interest now than when it was published, "On the Productive Resources of India." During the period of the Russian war, Dr. Royle drew attention to India as a source of the various fibrous materials used in the manufacture of cordage, clothing, paper, &c., by a lecture delivered before the Society of Arts in 1854. This lecture was afterwards expanded into a valuable work "On the Fibrous Plants of India," which was published in 1855. In the preface to this work, he announced that he was employed in a general work on "The Commercial Products of India," which, we believe, has not yet appeared. Dr. Royle was a Member of the British Association for the Advancement of Science, at whose meetings he often read papers, two of which deserve especial attention—one "On the Cultivation of Cotton," and another "On the Cultivation of Tea in the East Indies." He took an active interest in the last subject, and his efforts have been attended with complete success; as tea, rivalling that from China, is now produced in abundance in the Himalaya. For a short time he held the office of Secretary to the British Association for the Advancement of Science. He took an active interest in the development of the plan of the Great Exhibition of 1851; and the success which attended the exhibition of the Department of Indian Products was due, in a great measure, to his efforts. He was a Fellow of the Royal, Linnæan and Geological Societies, and at the time of his death held an appointment in connection with the East India Company in London.